THE

AMERICAN REVIEW OF TUBERCULOSIS

ABSTRACTS OF TUBERCULOSIS

VOLUME XLIII MARCH, 1941 ABST. NO. 2

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Childhood Tuberculosis.—The results of fifteen years' observation of Massachusetts school children are reported. Between 1924 and 1934, the Pirquet test was applied to approximately 400,000 children. For the first few years examination was given only to students who were underweight, had respiratory symptoms, showed abnormal physical findings or gave history of contact. In later years, examination was given all children whose parents' consent could be obtained. An attempt was made to determine developments in the entire group of 400,000 by checking all tuberculosis cases and deaths reported in Massachusetts from 1924 to 1936. The morbidity rate per 100,000 children tested was 79.7 among negative reactors, and 189.4 among positive reactors; the corresponding mortality rates were 25.0 and 52.1. The case fatality rate was slightly higher in the group of children originally tuberculin-negative; this observation casts doubt on the benign character of first infections acquired between the ages of six and sixteen. Intensive follow-up with annual X-ray examination was given children with tuberculous lesions of childhood or adult type and children with history of heavy exposure. In this group, 19,346 children were observed for at least one year. The mean age of the group at the beginning of observation was 11.4 years; the mean duration of observation was 3.4 years. Clinical tuberculosis developed in 142 children, of whom 31 died. The cumulative morbidity, calculated by the method of Frost, was 2.4 among children originally negative reactors, 2.4 among positive reactors with negative X-ray films, and 9.1 among reactors with tuberculous lesions. The age-specific morbidity, determined by the method of Herlitz, showed an increase in morbidity with increase in age; at each age the morbidity was higher among children, originally reactors to the Pirquet test. The authors conclude that in school children it is the age of the individual rather than the time of exposure or any environmental factor which determines the time at which tuberculosis develops. Tuberculosis morbidity rises rapidly after the age of ten, is higher in females than in males, higher among contacts than among noncontacts, higher among reactors than nonreactors and highest among reactors with positive roentgenograms.—*Development of Tuberculosis in Infected Children, A. S. Pope, P. E. Sartwell & D. Zacks, Am. J. Pub. Health, December, 1939, 29: 1318.*—(*H. L. I.*)

Metabolism in Tuberculosis.—Studies made on children with active afebrile pulmonary tuberculosis indicate that the basal metabolic rate may be used as an index of pathological activity. The rate is usually elevated during the period that physical findings, X-ray observation or sedimentation rates give evidence

that the disease process is active. No such elevation of the basal metabolic rate has been noted in children displaying the adult type, however extensive. Findings for 20 children selected from a larger series are reported. It is suggested that the cause for increased metabolism in the childhood type of pulmonary tuberculosis as opposed to normal metabolism in the adult type is probably related to the extensive involvement of lymphatic tissue in primary pulmonary tuberculosis.—*Basal Metabolism of Tuberculous Children. II. Afebrile Primary Pulmonary Tuberculosis, Anne Topper & Jean Shore, Am. J. Dis. Child., July, 1939, 58: 119.*—(*M. B.*)

Metabolism in Tuberculosis.—Three normal adolescent girls and three with minimal reinfection type tuberculosis were studied for calcium and nitrogen balances before and after the establishment of menstrual function. It was found that sexual maturation carried with it a depression in the retention of calcium and nitrogen, and that this retention paralleled the physiological fall in metabolic rate noted as maturation took place. It is suggested that diminution of these reserves of calcium and nitrogen may be a contributing factor in the increased incidence of tuberculosis in adolescent girls. The diminished retention may be prevented from reaching the point of negative balances by maintaining the diet at sufficiently high levels.—*Factors Influencing Retention of Nitrogen and Calcium in Period of Growth. III. Puberty in the Normal Girl and in the Girl with the Minimal Reinfection Type of Tuberculosis, J. A. Johnston, Am. J. Dis. Child., February, 1940, 59: 287.*—(*M. B.*)

Metabolism in Tuberculous Children.—Studies were made on the basal metabolism of 70 children with tuberculous pleurisy. Forty of them had active primary tuberculosis associated with tuberculous effusion. The majority of these children had an increased basal metabolic rate, ranging from +14 to +53 per cent, an average of +25 per cent. The metabolism in many of these patients restudied at a time when the infection was inactive was found to be normal. There were 15 children in whom the pleurisy was part of the adult, or reinfection, type of tuberculosis. The metabolic rates of these children were normal, averaging +8.6 per cent. Pleural effusion *per se* without demonstrable parenchymal or glandular involvement was without effect on the basal metabolism. Pleural reaction in the form of thickening of the pleura did not influence the basal metabolism. These studies emphasize our conclusions from previous studies; namely, that active tuberculosis of the primary type is usually associated with increased heat production.—*Basal Metabolism of Tuberculous Children. V. Tuberculous Pleurisy, Anne Topper & H. S. Rubin, Am. J. Dis. Child., March, 1940, 59: 535. (From Authors' Summary)*—(*M. B.*)

Body-build and Tuberculosis in Childhood.—In the Rhineland Children's sanatoria, children between the ages of twelve and fifteen were examined by the anthropological method of Martini and comparisons made with disease findings, as evidenced by clinical and X-ray examination. It is found that tuberculous children lag behind in growth in comparison with normals, particularly in the fifth year for boys and in the sixth year for girls. The children between the ages of two to four were underweight, while those from five to fifteen years were normal or even overweight. The children from two to eleven years were more leptosomic, those from thirteen to fifteen more pyknic than the tables for healthy children indicate. The primary and secondary forms of the disease do not show preference for any particular body-build. In the tertiary form, the proportion of leptosomics and eurosomics (Brandt) shows a high percentage. For the most part the exudative forms occur with particular frequency in the extremes of body-types.—*Der Körperbau tuberkulöser Kinder und seine Beziehung zum Krankheitsprozess, A. Polthoff, Beitr. z. Klin. d. Tuberk., 1939, 92: 612.*—(*R. K.*)

Epituberculosis.—Two patients are described in whom an inflammation around old tuberculous foci in the lungs appeared, in the one following a streptococcus sore throat, in the other after a Vincent's angina. These reactions are "parallergic" since they occur

during a phase of hypersensitivity. These infiltrations are not often observed, excepting in so-called *status lymphaticus* and in adults who have disturbances of the vegetative system.—*Unspezifisch-fokale bzw. parallergische Einflüsse bei Tuberkulose, F. Ickert, Ztschr. f. Tuberk., January, 1940, 84: 138.*—(*G. C. L.*)

Epituberculosis.—Wood reviews 96 cases of "benign pulmonary tuberculosis" occurring in the first two periods of childhood. They occur more often in boys than girls. Roentgenographically there are seen: (1) diffuse stippling corresponding to chronic miliary tuberculosis, (2) diffuse lobar opacities, corresponding to epituberculosis, (3) triangular opacities apparently based on the hilum viewed in anteroposterior films, which may be designated as "hilar flares," (4) peripherally located triangular shadows due to benign pleural effusions. In the group observed there were 27 of these latter, rarely accompanied by significant symptoms and thus contrasting with pleurisy in adults. Chronic miliary tuberculosis provides the typical "snowstorm" pattern and its pathological basis is verified by terminal calcifications of miliary character, progression to caseation in some instances and occasional necropsy confirmation. The lesions, however, are mainly exudative and usually resolve fairly rapidly. There were 8 cases of this type in the group. Hilar flares, 45 cases, formed the largest group. There is usually a paucity or absence of physical signs and its tuberculous nature must be established by associated evidence, such as appearance, contact, history, positive tuberculin reaction or demonstration of tubercle bacilli in secretions. To determine actually the site of the lesion a lateral film is recommended. This is considered more important than the posteroanterior for permanent record, because of lobe overlapping. Some of these opacities may be explained on a basis of local atelectasis. It should be recalled that the apex of the lower lobe is supplied by a special bronchus, the first dorsal branch of the main stem. Lobar opacities, termed epituberculosis, accounted for 18 cases. In 8 instances the right middle lobe was involved, in 5 the left upper. Right-sided lesions, however, predominate, 13 to 5. Certain French clinicians, who have most employed the term introduced by Eliasberg and Neuland, postulate a "benign tuberculous pneumonia" or "splenopneumonia," a term borrowed from Grancher. Two necropsies have been reported by Armand-Delille, one of which showed a "splenopneumonia" of the left lower lobe and swollen hilar lymph nodes. The other revealed caseous hilar nodes and an infiltration consisting of oedematous alveolitis. The commonest explanation of a highly allergic reaction around a specific focus is rather academic. A simpler explanation invokes a limited bronchial occlusion. The signs and clinical course are consistent with this explanation and bronchoscopy has proved that a caseous tuberculous node may occlude a bronchus. Mediastinal shift may often be demonstrated, although not always marked. These shadows always clear from the periphery. A large number of excellent roentgenographic reproductions accompany this paper. —*Epituberculosis, W. B. Wood, Tubercle, February, 1939, 20: 205.*—(*A. P.*)

Urinary Findings in Tuberculous Children.—In 549 children with tuberculosis, 106 showed some pathological findings in the urine. Nonspecific findings of the urinary system, in order of their frequency, were: cystitis, nephritis, congested kidney. The most common specific complication was toxic irritation of the kidneys, without tubercle bacilli in the urine, which had a good prognosis. In 7 cases there was a proven tuberculosis of the kidneys. In 4 children tubercle bacilli were found in the urine without development of a tuberculosis of the kidneys within three to six years. Two boys had tuberculosis of the genitalia, 12 boys and one girl developed amyloidosis of the kidneys. Two cases of renal calculi, 2 of ureteral calculi and one of a calculus in the bladder were found.—*Urinebefunde und ihre Bedeutung bei der kindlichen Tuberkulose, Aline Aicham, Ztschr. f. Tuberk., October, 1939, 83: 119.*—(*G. C. L.*)

First Infection Tuberculosis.—Primary infection in both children and young adults presents a variety of clinical pictures. There

may be an acute febrile onset with or without symptoms referable to the respiratory tract. More frequently the symptoms are relatively mild. The patient may run a low grade intermittent fever, present a picture of grippe or simply vague gastrointestinal symptoms, easy fatiguability and weight loss. In arriving at a diagnosis of primary infection there are 3 factors of the greatest importance: (1) contact history; (2) Tuberculin test which is usually strongly positive, and is of greater significance when it has been preceded only recently by a negative test; (3) chest roentgenograms. There are two types of infiltration, the juxtahilar type and the homogeneous peripheral infiltration. The latter is usually triangular and presents strands radiating into the surrounding pulmonary parenchyma. These lesions have one characteristic in common: their tendency to spontaneous regression. The basis of treatment is rest in hygienic surroundings. It is best to remove children from the family for a year.—*Diagnostic de la primo-infection tuberculeuse de l'enfant et du jeune adulte, J. Paraf, Progrès méd., August 5, 1939, no. 31, 1117.*—(*H. R. N.*)

Pulmonary Infiltrations in Childhood.—Filla believes that chronic infiltrations are more common in childhood than is usually accepted. He was able to observe these infiltrations in 150 out of 1800 children between two and fifteen years of age, an incidence of 8.8 per cent. He describes in this study their pathogenic, morphological and developmental characteristics at different ages, while examining the phthisiogenic importance of each group. The essence and evolution of these pulmonary infiltrations vary markedly, particularly with the age of the patients. In early childhood there is a tendency to extensive infiltrative forms, rapidly caseating and rapidly spreading to both lungs. In childhood and in the prepubescent period there is a tendency to insidious forms, sluggish and practically asymptomatic, hardly ever caseating. At puberty, on the other hand, there is a tendency again to the infiltrative forms, well circumscribed, but inclined to ulceration and caseation, and presenting constitutional symptoms. Infiltrations in childhood were observed rather frequently as a primary complex; in this series there were 63 cases, or 42 per cent, mostly among children five to eight years of age, that showed no clinical evidence of disease. Not rarely, however, even at this age infiltrations may assume the character of the adult type; in fact up to nine years of age the great majority of progressive infiltrations are due to primary infection. At puberty early infiltrations may not be readily differentiated from primary complexes in the roentgenogram, and perhaps they are not so uncommon as it is believed. Mild asymptomatic infiltrations, typical of childhood were observed in 37 cases, or 26 per cent of the total. They presented several varieties that could be divided in chronic and in regressive infiltrations; these latter being subdivided into ephemeral and mild. At puberty, over thirteen years of age, these infiltrations were mostly of the primary complex; in this series 21 cases, or 14 per cent, were thought to be so; although they probably were more numerous, not very characteristic or easily recognizable. Notably less frequent were infiltrations of recent foci, nodular haematogenous and interstitial lymphangitic processes, and also infiltrations of old fibrocalcareous lesions. As for their location, 6 per cent were apical, 41 per cent subapical, 26 per cent basal, and 23 per cent parahilar in the midzone. This predilection in childhood for mesial and basal infiltrations is much more remarkable, when we consider that two-thirds of all infiltrations seen in children up to nine years of age were in the lower half of the lung. The development of these infiltrations varied fundamentally with the following factors: above all, with the age of the child; with the site of the infiltration, the tendency to spread decreasing from apex to base; and finally with the genesis of the infiltrations, because the tendency to spread was highest for lobar and haematogenous infiltrations, lowest for lymphangitic, perifissural and parahilar infiltrations. Besides these primary infiltrations there were secondary ones, that were divided according to their pathogenesis into early, late or dependent; also infiltrative foci by secondary dissemination that might appear as foci of bronchopneumonia, either nodular or acinonodular. All these secondary infiltrative forms

possessed a marked tendency to caseation. According to radiological appearance, these infiltrations may be divided into early infiltrations, as described by Assmann-Redeker, lobar, perifissural and paramediastinal infiltrations. The first two types possess a strong tendency to spread, while the last two are essentially benign.—*Gli infiltrati nell'infanzia ed adolescenza e la loro importanza nella patogenesi della tisi, E. Filla, Riv. di pat. e clin. d. tuberc., July, 1939, 13: 517.*—(*S. L.*)

Primary Pulmonary Tuberculosis in Children.—Primary infection of the lung in childhood by tubercle bacilli rarely causes recognizable symptoms or signs and the entire process of invasion, resolution, organization and healing may occur with no evidence of its existence excepting roentgenographically. It is the complications and accidents which cause symptoms and signs and, sometimes, death. The earliest pathological lesion is a localized bronchopneumonic area with central softening and epithelioid and giant cells at the periphery. Tubercle bacilli are commonly demonstrable by suitable staining. The regional bronchopulmonary and tracheobronchial lymph nodes are ordinarily involved. Most initial lesions are subpleural and localized patches of pleurisy are common. Burke's experimental work with rabbits following inhalation of tubercle bacilli showed striking analogies with children. The present work is based on the observation of 850 infected children at the Children's Investigation Department of the Brompton Hospital, London, as shown by a positive tuberculin test and followed over periods up to eight years. Of these, 85 per cent of whom were known to have been in contact with open tuberculosis, 202, or 24 per cent, showed roentgenographic opacities interpreted as due to primary tuberculous lesions. Corroborative evidence was found in the deposition of calcium in the lung or corresponding hilar lymph nodes and the demonstration of tubercle bacilli in gastric contents or material removed bronchoscopically. None had a positive sputum. The lesions are classified into two main groups, the uncomplicated, in which either the pulmonary or glandular lesion may predominate and complications, especially atelectasis, bronchogenic spread and haematogenous spread, these all resulting from hilar lymphadenitis, and pleural involvement resulting from extension by contiguity or otherwise. All but one of those with the pulmonary lesion predominating were over three years of age, most about seven or eight. A few were constitutionally below par but most of them showed no definite symptoms or signs. Most of them showed enlargement of the hilar shadow on the same side, especially among the younger children but there was no definite relation. Subsequent X-ray films during three to six months showed gradual decrease in the lung opacity with increase in its density and definition. Early calcification in lung or lymph nodes appeared as stippling or sometimes as a central core increasing in size. A few did not develop this until two years but one showed its beginning at seven months. The calcium deposits usually increased in amount over a period of one to two years. Complete healing not infrequently takes four years or more. Many other children who had not shown detectable earlier lesions developed small calcific deposits and the converse is also probably true, but because the opacity lacked characteristic features it could not be definitely termed tuberculous. Predominant glandular involvement without complications is generally recognizable by X-ray. It may not be associated with a large pulmonary focus but healing is usually slower, the density decreasing over a period of twelve to eighteen months. Calcification may appear within a year and usually increases for a year or two more. Among the complications pulmonary atelectasis due to glandular pressure or erosion is of special interest. These patients exhibited symptoms varying from slight malaise to severe spasmodic cough and signs suggesting consolidation. Roentgenographic examination and bronchography give the clue to the diagnosis. It seems likely that the epituberculosis of Eliasberg and Neuland has some such underlying pathology. Bronchogenic spread may result in either areas of bronchopneumonia or atelectasis. Haematogenous spread commonly results in miliary tuberculosis. Five such cases were observed, 3 of which were fatal. Pleural involvement

may manifest itself as small effusions, sometimes followed by calcification. It is probable that the rate of healing of these primary infection lesions increases with improved nourishment and increased sunlight. Children showing gross hilar adenitis should receive special attention and, under two years of age, institutional care. General treatment is similar to that for tuberculous cervical glands, bones and joints. The advisability of bronchoscopy in cases complicated by localized atelectasis is still undecided.—*Primary Tuberculosis of the Lung in Children, A. M. MacPherson, Brit. J. Tuberc., April, 1939, 33: 79.*—(*A. P.*)

Follow-up of Tuberculous Children.—An analysis of the records of 10,003 children with an average age of nine years is presented. Initial reactions to tuberculin were negative for 7,107 of these children and positive for the remaining 2,896. On entry to the clinic roentgenograms of the chest were made of 84.3 per cent of the uninfected children and of 95.5 per cent of the infected patients. The percentage of children whose lungs were interpreted as normal on the basis of initial roentgenograms amounted to 92.9 for those with negative reactions to tuberculin and 57 for the tuberculin-sensitive group. Roentgenographically demonstrable lesions which were considered nontuberculous were revealed by 4.3 per cent of the roentgenograms of the children with negative reactions to tuberculin and by 4.7 per cent of the roentgenograms of the infected children. In each series of patients the incidence of lesions of this character tended in general to increase gradually in successive age groups. All of the remaining lesions reported by the roentgenologist for these two series of children were of the type which the tubercle bacillus produces. Relatively benign pneumonic infiltrations deemed representative of the earliest roentgenographically demonstrable stage of the broad primary phase of the evolution of pulmonary tuberculosis were found in 166 members of the infected group. The incidence of such lesions reached a maximum at about the third year of life and then diminished. Primary pneumonic tuberculous infiltrations were found only in the tuberculin-sensitive group. A general tendency for these lesions first to persist and later to resolve slowly was noted. Calcified and fibrosed deposits were revealed by 2.8 per cent of the initial roentgenograms of the children with negative reactions to tuberculin. The incidence of these lesions tended to increase slightly with advancing age. Calcified and fibrosed deposits were disclosed by 30.6 per cent of the initial roentgenograms of the infected children. For this series of patients the incidence of these lesions increased rapidly until the age of 8.5 years but subsequently manifested no consistent change. The calcified and fibrosed deposits were considered as representing an older stage in the evolution of primary pulmonary tuberculosis than was represented by the pneumonic tuberculous infiltrations found in 166 members of the series of infected patients. Initial roentgen study of 2,767 tuberculous children disclosed 49 patients with chronic pulmonary tuberculosis of the adult type. This form of the disease made its first appearance at the seventh year of life and tended to increase in relative frequency in each successive age group. Follow-up Study.—Follow-up data derived either from repeated roentgen studies, repeated tuberculin tests or verbal inquiry were obtained for 80.9 per cent of the children with negative reactions to tuberculin and for 85.2 per cent of the infected group. Approximately 72 per cent of each group of patients who were traced received the type of reëxamination deemed necessary to disclose the absence of clinical tuberculosis (repeated roentgen studies or repeated tuberculin tests for the uninfected children). The average initial age of the patients who were traced amounted to 8.4 years for the uninfected group and 9.9 years for the infected group. The former were traced for an average of 6.1 years and the latter for 6.9 years. The total person years of follow-up experience amounted to approximately 35,000 years for the uninfected group and 17,000 years for the infected group. During the course of the follow-up study chronic pulmonary tuberculosis was acquired by 16 of the 5,747 traced children whose initial tuberculin reactions were negative. For this group the incidence of this clinical variety of tuberculosis amounted to 2.8 cases per thousand children and 0.46 cases per thousand person

years of follow-up experience. Of the 2,467 traced children who entered Lymanhurst with positive reactions to tuberculin, 2,418 presented no evidence of chronic pulmonary tuberculosis at the time of the first examination. During the course of the follow-up study this form of disease was acquired by 58 members of the group. The incidence of newly developed examples of chronic pulmonary tuberculosis observed for this group of 2,418 infected children amounted to 24 cases per thousand patients and 3.4 cases per thousand person years of follow-up experience. Follow-up roentgen examination extending throughout an average period of seven years of 2,670 children with negative reactions to tuberculin and of 1,784 tuberculin-sensitive children disclosed marked changes in roentgenographic findings chiefly for the infected group, in which the incidence of roentgenographically normal lungs decreased from 53.9 to 36.9 per cent. During the follow-up roentgen study of the infected patients the incidence of primary pneumonic tuberculous infiltrations decreased from an average of 7.9 per cent to 0.7 per cent. This change resulted from the spontaneous resolution which these lesions were observed to undergo. The incidence of calcified and fibrosed deposits changed from an initial 31.6 per cent to a final 53.1 per cent. A major portion of this change resulted from the appearance of lesions of this character in many of the infected children whose initial roentgenograms revealed no evidence of pathological conditions. During the course of the follow-up roentgen study the incidence of chronic pulmonary tuberculosis increased from 2.7 to 6 per cent in the infected group. During the course of the follow-up study serious forms of tuberculosis considered representative of the second clinically demonstrable phase of the evolution of the disease (chronic pulmonary and miliary disease, tuberculous meningitis and osteoarticular tuberculosis combined) were acquired by 19 members of the originally uninfected group and by 98 members of the infected group. The combined incidence of these four serious varieties of tuberculosis per thousand patients and per thousand person years of follow-up experience observed for the infected group was approximately tenfold that recorded for the children who entered Lymanhurst with negative tuberculin reactions.—*Tuberculosis. A Follow-up Study of Children at Lymanhurst Health Center, C. A. Stewart, Am. J. Dis. Child., May, 1940, 59: 1034. (Author's Summary)*—*(M. B.)*

Infectious Diseases and Tuberculosis.—Observations on 945 children under six years of age with tuberculous infection or clinical tuberculosis, in whom some infectious disease was superimposed, revealed an activation of the tuberculosis in 84 cases. The frequency of infectious diseases (including grippe and throat infections) in this group is not greater than in children of urban and domestic surroundings. A study of 485 exacerbations occurring in the stage of generalization showed that the greatest number (401) did not occur in infectious disease. The activation is most frequently observed during and immediately after measles (19.1 per cent) grippe (13.2 per cent), grippe-like infections (17.5 per cent), pertussis (10.3 per cent); more rarely during or immediately after scarlet fever (7.6 per cent), diphtheria (6.4 per cent), purulent throat infections (6.3 per cent). Exacerbations of the process within the thorax and the appearance of scrofulous manifestations were common. Most of the exacerbations lasted many months, especially widespread pulmonary infiltrations, specific otitis, and diseases of the lymph nodes. The study did not show a preference for the very young. Nevertheless activation after an infectious disease is more likely to occur in children who were infected at an early age and have new, active localizations than in those with inactive stable processes. Only hospital cases under observation before, during, and after the infectious disease, and not the ambulatory cases, are suitable for research. The answer to the question of the rôle that immunobiological changes play in the causation of postinfectious exacerbation is based on the study of measles anergy: (a) prodromal hyperergy, producing rare, slight exacerbation, (b) hyperergy or anergy in the stage of eruption, with practically constant lowering of the resistance, (c) return of the allergy at the end of the disease with clinical manifestations of exacerbation, a frequent but not constant

finding. There is the possibility that a change of allergy and resultant exacerbation are provoked also in grippe by similar but nonspecific reactions. (Parallergic disease of Moro and Keller.) In a few rare cases a favorable change in the course of tuberculosis was observed after varicella and pertussis.—*Über den Einfluss infectiöser Erkrankungen im Säuglings- und Kindesalter, P. Zoelch, Beitr. z. Klin. d. Tuberk., 1939, 93: 550.*—(*R. K.*)

Method for Obtaining Sputum from Children.—A new suction method of obtaining sputum from infants and children either from the larynx or nasopharynx is described.—*An Original Method of Obtaining Sputum from Infants and Children, W. J. Auger, J. Pediat., November, 1939, 15: 640.*—(*M. B.*)

Primary Tuberculosis in Adolescents.—Although after the world war in urban communities 70 per cent of children at graduation from public school were tuberculin positive, there are now only 30 to 40 per cent positive and in rural districts even much less. In a rural district 12 patients, fourteen to nineteen years of age, came into observation with an open pulmonary tuberculosis; 11 had not had a tuberculous infection when leaving school. Almost all of them were of tuberculosis-free families. In most of the cases there was a far advanced haematogenous spread with cavitation. The primary tuberculosis in these adolescents ran a malignant course.—*Beobachtungen über Vorkommen und Erscheinungsbild der tuberkulösen Erstinfektion in Jugendlichen- und fruehen Erwachsenenalter, F. Koester, Ztschr. f. Tuberk., January, 1940, 84: 147.*—(*G. C. L.*)

Tuberculoma of Lung.—The author describes an unusual calcified pseudotumor of the lung, which on examination after removal proved to be a tuberculoma. Its outstanding characteristic, as viewed roentgenographically, was the arrangement in concentric laminations. Marked pulmonary symptoms are not a consistent feature of the disease. The concentric calcific laminations result from an outward progression of zones of necrosis with subsequent calcification. In removing the tumor a block resection was used which seems preferable, since there were active tubercles and chronic tuberculous granulation tissue at the periphery of the large tuberculoma, whereas there was no tuberculous involvement of the lung at the site of the transection.—*Tuberculoma of the Lung, C. Haight & J. M. Farris, J. Thoracic Surg., October, 1939, 9: 108.*—(*L. F. B.*)

Tuberculosis, Pregnancy and Abortion.—Pregnancy ordinarily does not modify the development of tuberculosis, and parturition does not act unfavorably, provided it is carried out under proper medical supervision. In the author's experience with 17 cases, pregnancy appeared to have no effect on the tuberculosis in 10, was of unfavorable influence in 3 and apparently brought about cure in 4 cases. Therapeutic abortion never proved beneficial. —*Casos clinicos de tuberculosas embarazadas en relación con el aborto, C. F. Barroso Piñar, Rev. de Med. y Cir. de la Habana, May 31, 1940, 45: 221.*—(*E. R. L.*)

Tuberculosis and Pregnancy.—Women who suffer from far advanced tuberculosis may recover so that they can undergo pregnancy and parturition without danger. Collapse therapy is no contraindication to future childbearing. The report covers 49 women with 76 births. There were only 2 fatalities and these were due to embolizations. There were 2 reactivations of the tuberculosis, which responded favorably to pneumothorax therapy. The average time that elapsed between the end of therapy and the onset of pregnancy was 5.3 years. In 9 women who nursed 13 children there was only 1 relapse.—*Tuberkulose und Schwangerschaft, H. Alexander, Ztschr. f. Tuberk., October, 1939, 83: 71.*—(*G. C. L.*)

Pregnancy and Tuberculosis.—The conclusions are derived from personal evaluation of the evidence in a series of 97 patients, of whom 68, having previously had a diagnosis of tuberculosis made in their own clinics, offered comparative clinical and roentgenographic records before the onset of pregnancy and in all but 5 postpartum observations were available, most of these extending from a few months

to five years. The ages of the women ranged between eighteen and thirty-five years except for one of forty-two years, this age period thus roughly corresponding with that in which tuberculosis is most prevalent. Multipara and primipara were about equal in numbers and 90 per cent of the patients were white, the others Negro. Of the entire group of 97 patients, 8 were recorded as having healed primary tuberculosis, 28 of the remainder were classified as fibrous or fibrocalcific in type, and in 9 the disease was controlled by collapse therapy at the time of pregnancy. In this group of 45 inactive cases, the tuberculosis remained unaffected except in 3 cases where an old lesion became reactivated. On the other hand, in a group of 52 active cases, as determined either by symptoms, X-ray evidence of mutation of the lesion or both, rapid progression of the tuberculosis ensued. In cases where tuberculosis was recognized for the first time during or immediately following gestation, the disease was both extensive and recent but almost always superimposed on older foci of mixed or productive type with or without cavitation which lesions are well known to be capable of progression under adverse circumstances. It seemed evident to the authors that women presenting exudative and mixed type pulmonary lesions run great risk of their tuberculosis progressing rapidly if pregnancy occurs and is allowed to continue. Less frequently these with productive type lesions or clinically quiescent may behave unfavorably. Too often it is found impossible to control the tuberculosis by bed-rest alone and the simpler forms of collapse therapy fail. Yet, if recognized early and subsequently carefully observed, lesions recognized early in gestation may be easily controlled if properly and promptly treated, an exception being noted that progressive changes may occur so rapidly as to prohibit or nullify the effects of any form of collapse therapy. Interruption of pregnancy was carried out in 7 instances with disappearance of symptoms and return to quiescence without other change in therapy and in 8 others natural delivery resulted in similar good results. Of these 15 patients, 8 were receiving pneumothorax at the time of final observations. Of the other active cases, 19 were dead. Although in 5 of these the disease was so extensive as to be invariably fatal, in the remainder (14) massive disease had apparently developed from very limited lesions. A positive prognosis is impossible in women with active or quiescent lesions capable of mutation under adverse circumstances, of which pregnancy may be one, as so clearly set forth by Rich. It is better for women with active or quiescent lesions to avoid pregnancy. The ultimate fate of pregnant tuberculous women in the latter group is worse than in a similar group of non-pregnant women. In the presence of fibrous or fibrocaseous tuberculosis or healed primary disease pregnancy is safe but the patient should be closely observed for possible reactivation of the tuberculosis.—*Pregnancy and Tuberculosis, B. S. Pollak & B. P. Potter, Tubercle, January, 1940, 21: 128.*—(*A. P.*)

Pregnancy and Tuberculosis.—Fifty tuberculous women were delivered in the Tönnisheide Tuberculosis Hospital. From this group, 13 patients are considered in detail. In 11 patients extensive progression of inactive pulmonary tuberculosis began with parturition and therefore parturition alone is considered responsible for this change. In 8 patients with pulmonary tuberculosis, early pregnancy proved to be a serious complication clinically and roentgenologically. The number of cases of pulmonary tuberculosis made worse by pregnancy and delivery is proportionally high. Koske cannot confirm the assertion, which is becoming continually more wide-spread, that the course of pulmonary tuberculosis is in no way unfavorably influenced by gestation. In several cases it was impossible to carry out the most desirable treatment. Surgical treatment in no way guarantees that progression of an activated tuberculous process may be controlled. Particularly unfavorable are births which are too numerous or too close together.—*Über den Einfluss von Schwangerschaft, Geburt und Wochenbett auf den Ablauf der Lungentuberculose, H. J. Koske, Beitr. z. Klin. d. Tuberk., 1939, 92: 550.*—(*R. K.*)

Pregnancy and Tuberculosis.—For a proportion of women, pregnancy is an unmixed blessing and subsequent pregnancies further

improve their general health. For a proportion also pregnancy is a physical, moral and mental calamity of the first magnitude. It is established that in England the vast majority of women develop tuberculosis and heal it without any difficulty. A few go through life and do not develop the disease. In some women, latent, relatively quiescent or active pulmonary tuberculosis is definitely improved by pregnancy. A proportion of such cases relapse during the puerperium. It is possible that pregnancy exerts a harmful effect on pulmonary tuberculosis in those women who, without tuberculosis, would naturally tolerate pregnancy poorly and exerts a harmless or even beneficial effect on those tuberculous women who, without tuberculosis, would tolerate pregnancy well. Patients with arrested tuberculosis may proceed to term with reasonable safety. No case should be aborted on principle, particularly if there is a history of manifest improvement since the onset of pregnancy. Such conservatism is worthy of consideration in the case of a tuberculous multipara who presents a history of abatement of phthisis during a previous pregnancy. Evidence of the effectiveness of collapse therapy during pregnancy is steadily accumulating and there is reason to suppose that with expert management prognosis for patients in whom tuberculosis and pregnancy coincide is by no means necessarily gloomy.—*Pregnancy and Pulmonary Tuberculosis, W. D. Brooks, J. Roy. Inst. Pub. Health & Hyg., March, 1940, 3: 67.*—(*L. F. B.*)

Jaundice and Tuberculosis.—Liver disease always causes an exacerbation of tuberculosis which is in the process of retrogression. Damage to the reticulo-endothelial cells of the liver is held responsible for this adverse effect. Because of the fact that more or less extensive damage to the liver takes place during the course of chronic diseases, it is desirable to attempt to combat it particularly before major operations. The author found favorable effects after large doses of vitamin C.—*Ikterus simplex und Lungentuberkulose, H. Trautwein, Beitr. z. Klin. d. Tuberk., 1939, 93: 594.*—(*R. K.*)

Dyspepsia in Tuberculosis.—Dyspeptic symptoms in tuberculous patients can be classified as gastric, intestinal, hepatic or pancreatic. Many of these are due to specific lesions. In others, no anatomical basis can be found. In a chronic disease such as tuberculosis, with periods of profound toxicity, it is not surprising to find many dyspeptic symptoms. These symptoms are sometimes aggravated by a too rich diet and by overmedication. The symptoms are rarely completely gastric or intestinal and are usually of a mixed type. Anorexia is a very common symptom. It is concerned with the quantity of the food rather than the kind; there is a rapid saturation rather than actual distaste for food. Anorexia is a manifestation of the toxic involvement of the nervous and glandular systems. Vomiting frequently occurs after paroxysms of coughing during which the cough reflex is transformed into the vomiting reflex. Tuberculous anorexia frequently yields to injections of anterior lobe extract or of strychnine. Vomiting may be diminished by the use of codeine, cocaine, and atropine. Oxygen inhalation is valuable in posttussic vomiting. Various dyspeptic symptoms without anatomical basis are found in about 30 per cent of patients. In general, at the onset of the tuberculosis, there is a gastric hyperchlorhydria while, terminally, hypochlorhydria is found. Febrile patients may show an hypochlorhydria at the onset while well nourished patients may show an hyperchlorhydria even terminally. Tuberculous patients with increased gastric acidity rarely have diarrhoea while those with diminished acidity frequently have it. This increase and diminution of acid are frequently accompanied by gastric hypermotility and atony, respectively. The stimulation of the vagus, frequent in tuberculosis, plays a part in gastric spasm and hyperacidity; vagal inhibition is important in the pathogenesis of gastric atony. The flatulence can be explained by slowing of the portal circulation. Involvement of the solar plexus, in the course of toxaemia or bacillaemia, accounts for much of the abdominal pain and cramps. Nontuberculous diarrhoea is frequent in patients with pulmonary tuberculosis. Hypochlorhydria and an incompetent pyloric sphincter will

explain the diarrhoea in many of these cases. Sometimes pancreatic insufficiency will account for the diarrhoea; relief is often obtained by giving massive doses of pancreatic extract. A large group of gastrointestinal symptoms in tuberculous patients is caused by diaphragmatic involvement, either inflammation or paralysis or atony and atrophy produced by therapeutic procedures such as pneumothorax and phrenicectomy. The symptoms are referable primarily to displacement and abnormal position of the abdominal viscera. Involvement of the right diaphragm is more apt to produce abdominal pain and cramps while left sided involvement produces meteorism, flatulence and relatively little pain. These symptoms will sometimes disappear in the course of time when the viscera, particularly the stomach and colon, have accommodated themselves to their new position.—*Les dyspepsies des tuberculeux, M. Loeper, Progrès méd., March 2, 1940, 68: 182.*—(*H. R. N.*)

Erythema Nodosum and Tuberculosis.—A review of the literature shows a variety of opinions regarding its aetiology; the majority, however, consider it tuberculous, and many consider it as a primary manifestation of tuberculosis. After reporting a three year old girl who had a classical form of miliary tuberculosis, confirmed by X-ray studies, less than a month after having shown *erythema nodosum*, Valli also reports 3 young women, employed in his sanatorium, who developed *erythema nodosum* about five months after employment. All had the typical syndrome of high fever, muscular and joint pains, headaches and gastric upset preceding the eruptions on the extensor surface of the legs. These 3 women had had a physical examination, supplemented by chest films, when employed, and none revealed even minimal signs of a lesion, either active or healed. Radiograms taken soon after recovery from *erythema nodosum*, and two months afterwards, did not show any changes from the original films. But all reacted strongly to a weak solution of OT: one woman to 0.1 cc. of 1 to 25,000 dilution and the other 2 women to 0.1 cc. of 1 to 10,000 dilution. Valli concludes that *erythema nodosum* gave these 3 women a marked degree of allergy, and believes that these cases demonstrate further a close relation between this syndrome and tuberculous infection.—*Contributo clinico allo studio dei rapporti fra eritema nodoso e tuberculosi, M. Valli, Riv. di pat. e clin. d. tuberc., July, 1939, 13: 539.*—(*S. L.*)

Erythema Nodosum and Tuberculosis.—Erythema nodosum is generally conceded to be a symptomatic manifestation of disease with an allergic cutaneous reaction. It has been correlated with tuberculous infection in many cases; it has been noted also in quasi-epidemic form in some tuberculous families. This is a report of 2 cases in which erythema nodosum appeared just before symptoms of tuberculous disease occurred. Both patients were young females, working in a sanatorium, who a few months after employment became ill with chills, fever and pains in the lower limbs. Soon the typical nodular eruption presented itself. Between fifteen to twenty days eruption and symptoms disappeared in both cases. Both became ill two months later with pulmonary symptoms. X-ray examination of the chest revealed infraclavicular infiltration with excavation in one case, and a moderately large effusion in the other. The first patient had a positive sputum, and in spite of an early collapse of the lung by pneumothorax, the process became bilateral and progressive. The patient died two years later. The second patient had a culture of the pleural fluid positive for tubercle bacilli, and required repeated aspirations for a period of forty days before complete recovery. It is important to note that both women were perfectly healthy at the time of employment, and that original chest films were negative for any pathology. The belief seems justified that subsequent tuberculosis was correlated with erythema nodosum in these two women. Neither patient was physically well during the two months that elapsed between the two clinical conditions. Unfortunately neither patient had had a tuberculin test at the time of employment, and therefore it is not known whether the erythema nodosum was a primary manifestation.—*Eritema nodoso e tuberculosi, R. Guglielmetti & S. Calococi, Ann. d. Ist. Carlo Forlanini, March-April, 1940, 4: 293.*—(*S. L.*)

Mitral Stenosis and Pulmonary Tuberculosis.—In 1890 Potain and his pupils held that pure mitral stenosis was tuberculous in origin. The tuberculous process invaded the mitral valve provoking a stenosing marginal endocarditis, the mitral stenosis in turn produced stasis in the lung preventing the evolution of tuberculosis in the lungs. If this were so it would be necessary to consider the mitral stenosis as an attenuated form of tuberculosis and to attribute to it the curiously providential rôle of destruction of the disease which has produced it. As is known, the tubercle bacillus selects the pericardium and myocardium but proven tuberculous lesions of the endocardium are rare. Various explanations have been proposed regarding the antagonism between mitral stenosis and pulmonary tuberculosis. Potain at first thought the mitral lesion was an abortive form of tuberculosis. Peters suggested that the disturbed pulmonary circulation caused oedema of the bases of the lungs forcing the apices to more active work preserving them from pulmonary tuberculosis. Lépine believes that the oedema and congestion make a poor soil for the bacilli. Burnand, however, observed 8 cases of mitral stenosis with a bilateral ulcerocaseous tuberculosis. The authors observed a similar case. The patient, a girl of sixteen was found to have a typical mitral stenosis. An X-ray film showed a parahilar shadow of soft contours extending into the right base where there was extensive involvement. A similar shadow was seen in the left base. The shadows were at first thought to be due to stasis. However, the sputum was positive for tubercle bacilli. Later a cavity appeared in the hilum. Subsequently the patient died and the diagnosis was confirmed at autopsy. The case demonstrates not only the coexistence of the two diseases but also that the mitral stenosis may camouflage the tuberculous pulmonary lesion. Conversely a fulminating clinical picture of pulmonary tuberculosis may obscure clinical evidence of a mitral lesion.—*Rétrécissement mitral et tuberculose pulmonaire, A. Patoir & E. Watel, Arch. méd. chir. de l'app. respir., 1938, no. 6, 13: 451.*—(*J. E. F.*)

Psychology and Tuberculosis.—The initial management of pulmonary tuberculosis would be relatively simple if no consideration had to be taken of the patient's personality. Personality is constantly affected by the disease and, more important, the disease is greatly affected by the personality. In planning a course of treatment for a patient it is very important to consider his domestic and social situation. The attending physician must be ready to meet the psychological needs of his tuberculous patients whose social and economic states are so varied. Mental adaptability is limited by individual characteristics and psychological adjustments must be made a part of every initial program in order that valuable time may not be lost.—*Initial Management of Tuberculosis with Special Reference to the Psychology of the Patient, L. J. Moorman, Ann. Int. Med., November, 1939, 13: 849.*—(*A. A. E.*)

Bovine Tuberculosis.—Pulmonary tuberculosis of bovine origin was found in a considerable proportion of children, both in Amsterdam and other large cities, whereas in adults it is predominantly of human type and aërogenous. The bovine type may also be aërogenous. It is responsible for 20 per cent of nonpulmonary forms. The clinical features of pulmonary tuberculosis of the two types are similar. About one-third of cases of meningitis in children are due to bovine type infection.—*On Tuberculosis in Man Due to the Bovine Type of the Tubercle Bacillus in the Netherlands, A. C. Ruys, Tubercle, September, 1939, 20: 556.*—(*A. P.*)

Protamin Zinc Insulin in Diabetes and Pulmonary Tuberculosis.—In the pre-insulin era the prognosis of "diabetic tuberculosis" was extremely bad, age not being an important factor, and for some time after the introduction of insulin matters were very little altered. Only more recently with the development and use of purified and crystalline insulin preparations, not productive of protein reactions, have results been better. It is now accepted that the successful treatment of diabetic tuberculosis can only be achieved after the diabetic metab-

olism is effectively controlled, while it has been shown that tuberculous patients whose diabetes is under control can be treated otherwise like those with normal metabolism. Now, by allowing a diet relatively rich in carbohydrates and using relatively large doses of insulin, it is possible to bring about satisfactory weight gains. Since the development of protamin zinc insulin by Hagedorn and collaborators (1936) further advances in treatment were facilitated. The present report is based on the observation of 10 cases of "diabetic tuberculosis" at the Tuberculosis Sanatorium Weinmanova Nadace, in Czechoslovakia in 1938, the report being made from the Middlesex County Sanatorium, Harefield, England. *Results*: In 7 cases the period of observation was sixty to one hundred and ninety days, in 3 from fourteen to thirty days. Eight had been previously treated with ordinary insulin. The ages were twenty-six to sixty-four years. All the patients received about 2,700 calories food intake, the uniform diet consisting of 200 grams carbohydrates, 110 grams protein, 160 grams fat. The 8 patients previously treated with ordinary insulin received 60 to 100 units in 3 injections, morning, noon and evening, and all were sugar free. At least once a week the fasting blood sugar was determined and repeated daily blood sugar curves were done, the data for these consisting of the fasting blood sugar and the estimations made one hour after each meal and at 9 p.m. Clinically the patients showed more or less advanced unilateral and bilateral pulmonary tuberculosis. All were afebrile and nonprogressive at the time of observation. Artificial pneumothorax was employed in 5 unilateral cases, phrenic avulsion in one. All the patients showed considerable weight gains, up to 20 pounds, and all had limited and controlled exercise while under observation. No untoward focal or general reactions were observed. The Protamin in the preparation used, P.Z.I. "Organon," is not a complete protein but a dipeptid, containing 0.002 per cent nitrogen, and in no case was any effect observed on temperature or erythrocyte sedimentation. A single morning dose proved sufficient and, on the whole, about 20 per cent less was needed to produce the desired effects than of ordinary insulin. Its influence on the fasting blood sugar was particularly remarkable, leading to the belief that its action continues or is enhanced during the night, abolishing the otherwise frequent nocturnal spontaneous hyperglycaemia. Thus, cases previously balanced by ordinary insulin need be given only two-thirds of that dosage in P.Z.I., the optimum being subsequently determined by the daily blood sugar curve.—*Protamin Zinc Insulin in the Treatment of Diabetes Complicated by Tuberculosis, E. Nassau, Tubercle, January, 1940, 21: 132.*—(*A. P.*)

Diabetes and Tuberculosis.—In a group of 3452 patients with pulmonary tuberculosis seen during the past three years there were 56 patients, or 1.6 per cent, with associated diabetes. There was familial tuberculosis in 20 to 30 per cent, familial diabetes in 10 to 20 per cent of these patients. With the exception of the young diabetics the patients were forty years and older, and there was no striking difference among males and females. In the majority of patients tuberculosis was superimposed upon a preëxisting diabetes and was exudative or exudative-productive in character. In a few patients diabetes was secondary to a fibrotic pulmonary tuberculosis, which subsequently became exudative. When diabetes and tuberculosis were associated, the sedimentation rate was occasionally less elevated and the temperature lower than anticipated. The severity of the diabetes in the various age groups showed no essential difference when combined with tuberculosis than when diabetes alone is present, and there was no parallelism between the severity of the diabetes and the form of tuberculosis. Spread or progression of the pulmonary tuberculosis, and especially exudative pleuritis, were found to have an unfavorable influence on the course of the diabetes. Diabetes when combined with active pulmonary tuberculosis reduced the life expectancy of the patient to three years, or at best to one half that of the patient with active pulmonary tuberculosis without diabetes.—*Lungentuberkulose und Diabetes, A. Fett, Ztschr. f. Tuberk., April, 1939, 82: 113.*—(*A. B. C.*)

Oesophageal Ulcer and Pulmonary Tuberculosis.—Following a successful induction of pneumothorax on the left in a twenty-eight year old male, a first stage thoracoplasty was performed on the right. On the day following operation, haematemesis occurred and was assumed to originate from an occult gastric ulcer. Haematemesis persisted until death on the third postoperative day. At autopsy 200 cc. of brownish, sour smelling fluid containing hydrochloric acid was found in the left pleural cavity. Three punched-out ulcers were found in the lower segment of the oesophagus, and on microscopical examination the structure of typical peptic ulcers was present. Apparently performation of these ulcers into the left pleural cavity with fatal haemorrhage had occurred during the operation due to an increased mechanical strain on the mediastinum. Although the patient described had no gastrointestinal symptoms, the author recommends that in the presence of symptoms leading to a diagnosis of peptic ulcer, thoracic surgery should not be attempted until the peptic ulcer is cured.—*Ulcera peptica oesophagi und Lungentuberkulose, R. Pfaffenberg, Ztschr. f. Tuberk., April, 1939, 82: 123.*—(*A. B. C.*)

Mixed Infections and Tuberculosis.—The problem of mixed infections has received little attention in recent years. Numerous bacteriological experiments show that a mixed growth of Pfeiffer bacilli and haemolytic streptococci usually plays a definite rôle in the toxic aspects of tuberculosis. These agents probably cause the specific toxaemic symptoms, such as the change in blood picture, the acceleration of the pulse, and the damage to heart and circulation. This knowledge should bring about an adequate treatment of the mixed infection. By this treatment the defense mechanisms of some tuberculous patients might be favorably influenced.—*Über die Bedeutung der Mischinfektion bei Lungentuberkulose, A. Sylla & A. Kairies, Beitr. z. Klin. d. Tuberk., 1939, 93: 49.*—(*R. K.*)

Atelectasis during Tuberculosis Relapse.—The origin and development of atelectasis in the course of early infiltrative lesions have been known for a long time. Atelectatic areas of varying size are characteristic of tuberculosis. The important feature in the course of the early forms of tuberculosis seems to be the infiltration, "infiltrative Frühformen". There is a perifocal inflammatory infiltration on an allergic basis. Although clinical and X-ray signs had led to the diagnosis of infiltration, on section only atelectasis was present. The infiltration causes the development of an atelectasis. Infiltration and atelectasis can disappear or a chronic induration with atelectasis can develop, the atelectasis being even more prominent. Infiltration is always the first process, atelectasis the second.—*Zur Einordnung atelektatischer Vorgaenge im Ablauf des Tuberkuloseschubes, F. Redeker, Ztschr. f. Tuberk., January, 1940, 84: 170.*—(*G. C. L.*)

Hyperacute Tuberculosis.—In a twenty-five year old male, routine X-ray examination revealed a small infiltration in the right upper lung field. Twenty days later the findings were unchanged. Six weeks later haemoptysis occurred and the patient died after ten days. Autopsy revealed an acute haemotogenous and bronchogenic tuberculosis of both lungs originating from a caseous focus in the right apex.—*Phthisis acutissima, F. Roll, Ztschr. f. Tuberk., February, 1940, 84: 214.*—(*G. C. L.*)

Weather and Tuberculosis.—Patients with tuberculosis often are very sensitive to changes in atmospheric conditions. The author examined the kind, intensity, frequency and coincidence of symptoms and signs and their relation to the weather. The symptoms and signs are: central and peripheral nervous disturbances, lability of body temperature and blood pressure, and increase in sputum, haemorrhages and pneumothorax effusions. Out of one hundred and forty-six days, with changes in the weather in one hundred and four days, the symptoms of the patients were increased. The effects produced by changes in the weather are most striking after a prolonged period of good weather. Prophylaxis and medicinal therapy may be of use.—*Über Wettereinflüsse auf Tuberkulosekranke, A. Schuberth & R. Gruner, Ztschr. f. Tuberk., September, 1939, 83: 12.*—(*G. C. L.*)

Chronic Ulcerative Fibroid Tuberculosis.—Among 300 patients with open tuberculosis under the observation of a modern clinic, 82 were in a stable state in which no therapeutic measures were possible. The problem of those patients who are a permanent danger for their surroundings cannot be solved with institutional care. Early preventive measures, even compulsory treatment, may be effective in diminishing the number of these cases.—*Zum Problem der ungeheilten Offentuberkulösen, F. Benninghof, Ztschr. f. Tuberk., January, 1940, 84: 125.*—(*G. C. L.*)

Massive Collapse.—Numerous theories have been advanced to explain the occurrence of massive pulmonary collapse. These hypotheses have failed to withstand closer investigation. It has been proved that massive collapse can be produced with certainty by complete obstruction of a bronchus, and by this method alone. Reëxpansion of the lung can be effected by removal of the obstruction provided that pulmonary infection has not set in. The most common cause of obstruction in cases where there is no obvious obstructing agent such as tumor is generally assumed to be viscid sputum. The reduction of lung volume occasioned by the collapse results in an increased tension within the thoracic cage. The plug of sputum is sucked into the more peripheral bronchi, while the more proximal bronchi, now open to the atmospheric pressure, expand as they become subjected to the increased intrapulmonary tension. In the uncollapsed portion of the lung this outward pull is taken up mainly by the alveolar tissue but in the collapsed lung the less rigid, more distal bronchi are subjected to this tension. This will result in a bronchiectasis which in the early stage is simply a mechanical dilatation. Should the ectasia persist, infection supervenes and septic bronchitis results. Bronchiectasis is probably always secondary to massive collapse. Spread of the bronchiectasis takes place not by the "spill-over" method but by impaction of sputum in other bronchi with resulting collapse. While collapse of lung involved by tuberculosis often retards the progress of the disease, certain harmful effects may result. Tuberculous foci in uncollapsed lung may be aggravated by the resulting hyperfunction. In the case of a tuberculous cavity, after the onset of collapse, the air is absorbed from the cavity until the decreasing pressure within is overcome by the atmospheric bronchial pressure beyond, and the intervening plug of sputum is sucked back into the cavity. A free airway to the cavity only is established and the pressure therein rises to atmospheric levels. In addition the increased intrapulmonary tension is exerted upon the walls of the cavity and the latter expands until the balance of pressures is restored. The cavity may assume a size approaching that of the original lobe or lung involved in the collapse, resulting in the hitherto unexplained total excavation of lobe or lung. If the cavity in a collapsed lobe is surrounded by an effective pneumothorax, the raised intrapleural pressure compensates for the increased intrapulmonary tension. Bronchiectasis in the tuberculous lung has the usual characteristics, the chief additional feature of note being upper lobe incidence. Collapse may occur in a lobe or entire lung. Lobular collapse also occurs. Intermediate between lobar and lobular involvement, collapse may also occur in a main subdivision of a lobe, so-called sectoral collapse. Collapse complicating tuberculosis may be due primarily to hilar adenitis, a plug of sputum, haemorrhage or tuberculous bronchitis; secondarily to thoracoplasty, thoracotomy, phrenic paralysis or pneumothorax. Clinically, absorption collapse may be divided into simple or benign collapse and infected collapse. The former is apt to be symptomless while the latter presents the picture of a pneumonia or pneumonitis. While physical signs may be of value in the diagnosis of collapse, the X-ray is of prime importance. In many cases of pulmonary tuberculosis absorption collapse seems to have no effect on the disease. Occasionally, arrest of the disease with cavity closure may result. In the early treatment of absorption collapse, the primary aim would appear to be to remove the obstructing agent. Bronchoscopy should, therefore, be carried out whenever feasible although the results are frequently disappointing. Postural drainage and hyperventilation, by means of carbon dioxide inhalation, have been employed with varying results. Pneumothorax has been ad-

vocated for absorption collapse occurring postoperatively, as well as for collapse occurring in pulmonary tuberculosis. Phrenic paralysis may be considered in those cases in which gross displacement is causing serious symptoms and where the pleura is adherent. Thoracoplasty is sometimes employed for cases of chronic collapse with gross bronchiectasis. Lobectomy may be considered in certain cases of chronic collapse. Where pneumothorax is considered for alleviation of symptoms and when intrapleural pneumothorax is not feasible, extrapleural pneumothorax may be considered. In the prevention of absorption collapse, postoperative prophylaxis in the form of atropine, postural drainage and carbon dioxide inhalation is of great importance.—*Massive or Absorption Collapse in Pulmonary Tuberculosis, G. S. Erwin, Brompton Hosp. Reports, 1939, 8: 43.*—(*H. R N.*)

Haematogenous Tuberculosis.—A twenty-five year old man became acutely ill during his military service. The symptomatology suggested acute general miliary tuberculosis. The X-ray pictures showed a miliary spread in both lungs which healed in the course of the following months. During this period various tuberculous processes developed simultaneously in the skeletal and urogenital system. The patient died of tuberculous meningitis about one year after the onset of his disease. Autopsy revealed an active focus in the lung which gave the impression of a primary lesion. The healing of the other pulmonary foci and the progression of the extrapulmonary lesions was confirmed. Many tuberculous manifestations were found which had not been diagnosed *in vivo*. The clinical history therefore gave no complete information as to the sequence of development. On the other hand the case demonstrated how difficult it may be to determine the exact age of foci from postmortem findings. The anatomical picture suggested a progressive conglomerate tuberculosis of the left epididymis, the prostate and the seminal vesicles being more recently involved than the left testicle. Clinically the affections of both testicle and epididymis had been diagnosed eleven months before death. About one month and a half later these organs were extirpated on the right side and then showed a picture similar to that found at autopsy on the left. The question whether all these foci developed with the same spread coincident with the beginning of the acute disease cannot be answered. The subsequent progression with the development of numerous bone and joint foci is supposed to be caused by several haematogenous spreads such as described in Schürmann's *Durchseuchungs* theory. A detailed summary of the literature is given which deals with similar cases regarded as chronic disseminated haematogenous tuberculosis and with the different theories and experimental work on this subject.—*Zur Pathogenese der chronischen, hämatogen disseminierten Tuberkulose, W. Schlesinger, Schweiz. med. Wchnschr., March 4, 1939, 69: 189.*—(*A. B. T.*)

Sarcoidosis.—Eleven patients with generalized sarcoid were studied over a period of four years, including two who have been clinically well for two years. This group is the second in which Negroes predominate and includes the first in an American Indian reported. The group consisted primarily of young adults. Lesions of the skin predominated in 4 cases, and generally were in the form of painless papules, 1 to 5 mm. in size, with no surrounding erythema, induration or anaesthesia. Destruction and distortion of the nares were prominent in 2 patients. Enlargement of the peripheral lymph nodes was the most prominent feature in 5 cases and occurred in all but 2 of the other cases. Pulmonary lesions were of three types: 1) peribronchial fibrosis and thickening; 2) soft infiltration in the midlung fields sparing the apices; 3) areas resembling miliary tuberculosis, with a fine marble or reticular appearance. Trabeculation and cyst formation in the hands and feet and cysts of the tibia, ulna and cuneiform bone were seen. Pathologically, these cystic areas are composed of sarcoid tissue in bone. Longitudinal ridging of the nails occurred in one case. Invasion of the eye, producing iridocyclitis and keratitis, occurred in one case. The eyelids were involved in 5 instances and the lachrymal gland was enlarged in one patient. Skeletal muscle was extensively involved in one case. Nodules

along the epididymis were noted in one case. Occasional enlargement of the liver and spleen without jaundice or ascites was noted. Fever was conspicuously absent. The most striking pathological observation was the complete absence of inflammation in the tissues surrounding the lesions. The lesions were composed of groups of epithelioid cells, usually resembling tubercles. The pathological picture varied from that usually reported in the complete absence of eosinophiles, the presence of moderate numbers of giant cells in acute lesions and the occasional presence of necrosis and amyloidosis. The white blood cell count was usually normal or slightly elevated. Erythrocyte sedimentation was increased in the active cases and normal in the 2 cases in which the disease had apparently healed. The serum proteins were above 8 g. in 8 patients but the albumin-globulin ratio was reversed in all active cases. In 2 patients in whom the condition had healed the total proteins and the albumin-globulin ratio were normal. The blood calcium level was increased beyond normal limits in 6 patients and was at the upper limit of normal in 2 cases. The blood phosphorus was not altered but the phosphatase was increased at some time in 7 cases in which it was determined and in which the condition was active. A substance resembling Bence-Jones' protein was found in the urine in 2 cases. Aetiological studies with emphasis on fungi and acid-fast bacilli, using animal inoculation, cultures and serological and cutaneous tests, gave negative results. The cutaneous test of Williams and Nickerson (using an extract of involved lymph node) gave negative results. It is concluded that the aeriological agent remains unknown and that no specific treatment has been discovered. The detailed histories of the 11 cases are cited.—*Generalized Sarcoidosis of Boeck, G. T. Harrell, Arch. Int. Med., May, 1940, 65: 1003.*—(*H. R. N.*)

Sarcoidosis.—Besnier observed the first case of this condition in 1889 as a lesion of the skin and named it *Lupus pernio.* Ten years later Boeck designated the nodular form of the same infiltration as cutaneous sarcoid. Later after recognizing their tuberculous behavior he proposed the name lupoids. In 1909 Heerfordt of Copenhagen, an ophthalmologist, described a syndrome consisting of ocular lesions and parotitis with bilateral facial paralysis. The relationship between the skin lesions and the uveoparotid syndrome was only recently recognized by Pautrier. The present conception of the Besnier-Boeck disease is that it is a generalized disorder, capable of multiple localizations and the cutaneous and ocular forms are its principal manifestations. This viewpoint originated chiefly from the clinical and histological researches of Schaumann who proved in 1914 the identity of the diffuse infiltration of Besnier with the sarcoids of Boeck and recognized the same tuberculoid granulations in lymph nodes, tonsils, bone and lungs. Finally, he showed that diagnosis of this condition can be made by biopsy of the skin or lymph nodes. In recent years attention has been focused on the pulmonary forms of this condition chiefly because of the roentgenogram. The lung involvement is erroneously thought to be fibroid tuberculosis. The pulmonary form is not uncommon in tuberculosis hospitals. It occurs equally in both sexes, at all ages but most often between the ages of ten and forty years. Clinically, the disease is characterized by its diffuse nodular dissemination in the organs and by its benign nature; there is no destruction or suppuration and ultimate resorption of the lesions occurs. There is usually no functional impairment of the involved structures. Occasionally there is slight fatigue, slight fever and loss of weight. Three types of infiltration are seen radiographically: 1) the most frequent and characteristic is a micronodular infiltration bilaterally distributed and granular in appearance; 2) the second radiological type is a more or less dense, marbled and sometimes confluent infiltration often radiating from the hilum such as one sees in fibrotic tuberculosis; 3) the third type is predominately perihilar infiltration suggesting lymph node involvement such as in Hodgkin's disease. The diversity of clinical forms of the disease is explained by the association of multiple lesions, for seldom is only one organ involved. Contrariwise, seldom are all the organs involved in the same patient. From the anatomical point of view Besnier-Boeck's disease differs from tuberculosis

chiefly by the absence of caseation. But looking at the disease in its broadest aspects one gets the impression that it is of tuberculous origin. Many authors however, feel that a specific virus is the cause of the disease.—*Les formes pulmonaires de la maladie de Besnier-Boeck-Schaumann, G. Thoyer, Arch. méd. chir. de l'app. respir., 1939, no. 1, 14: 55.*—(*J. E. F.*)

Myeloblastic Reaction in Tuberculosis.—A forty-three year old woman was seen complaining of weakness, intermittent fever, swollen glands, cough and petechial haemorrhages of nine and one half months duration. She manifested a generalized lymphadenopathy, markedly enlarged tonsils and a palpable spleen. The blood picture on numerous examinations was that of myeloblastic leukaemia. The white count ranged between 3,300 and 22,100. Myeloblasts comprised anywhere from 73 to 88 per cent of the total. There was temporary improvement on treatment with vitamin C and X-ray, but subsequently the patient died following a gingival infection. The postmortem examination, both grossly and histologically, presented a widespread miliary tuberculous dissemination involving all the body cavities, lymph nodes and tonsils. There was no evidence of an older lesion anywhere in the body. The primary complex appeared to be composed of one tonsil and the draining cervical nodes. The remaining lesions fell into the postprimary dissemination stage. Similar cases have been described by other authors. Careful study of such cases shows that in practically every instance the picture is that of a first infection with dissemination in an adult. It may be that in such instances the marrow reacts in an unusual manner with extreme myeloblastic proliferation. This seems to be further corroborated by studies of groups of people after first contact with tuberculosis. In these groups a tendency to widespread purpura and other haemorrhages has been described. This myeloblastic reaction to a specific stimulus must be differentiated from true acute and subacute leukaemia.—*Tuberkulose und myeloblastische Reaktion, H. Geissler & H. Wurm, Klin. Wchnschr., September 9, 1939, 18: 1212.*—(*H. R. N.*)

Myeloblastic Reaction in Tuberculosis.—Following a short bacteriological survey of avian tuberculosis the case-history of a man of thirty-four years is presented. The patient had cough, fever, loss of weight and hepatosplenomegaly. There was a hypochromic anaemia, a leucocytosis of 33,000 with 28 per cent myelocytes and 53 per cent premyelocytes. The diagnosis of myeloid leukaemia was made. The patient died with septic skin abscesses and lobular pneumonia. Autopsy revealed a nodular tuberculosis of liver, spleen, lymph nodes and bone marrow. The histological picture resembled that seen in avian tuberculosis. Cultures and animal experiments did not confirm that the tubercle bacilli were of the avian type. In spite of these negative bacteriological results the diagnosis of avian tuberculosis is upheld, since this case simulates previous reported cases of avian tuberculosis.—*Myeloblastenreaktion bei atypischer Tuberkulose (Gefluegeltuberkulose?), R. Stöger, Wien. klin. Wchnschr., May 24, 1940, 53: 419.*—(*G. C. L.*)

Intercostal Lymphadenopathy.—The discovery, during the course of an upper-stage thoracoplasty, of two large intercostal lymph nodes is reported. The nodes, situated in the second and third posterior interspaces, were the size of large olives. Histological study showed multiple areas of caseation and tubercle bacilli were found on culture. The infection was presumably the result of drainage across the adherent pleura from the chronic pulmonary lesion. The author suggests that caseous lymph nodes of this sort, rather than osseous lesions, are frequently responsible for cold abscesses of the chest wall.—*Adénopathie intercostale tuberculeuse, J. Arnaud, Rev. de la Tuberc., 1939-1940, no. 8, 5: 976.*—(*H. L. I.*)

Cervical Adenopathy.—A study was made of the concomitance of pulmonary tuberculosis and cervical adenopathy in 200 patients. Palpable cervical nodes were present in 61 per cent of cases. Of these, in turn, 34.2 per cent were supraclavicular and 65.8 per cent were upper cervical nodes. In only 10 per cent of cases were both upper and supraclavicular nodes involved. In about 35 per

cent of all cases unilateral pulmonary lesions were present, and 62 per cent of these had palpable cervical nodes more or less equally distributed on both sides; i.e., there was no correspondence between pulmonary lesion and enlarged cervical nodes in respect to the side of the body. Accordingly it is logical to consider the nodal infection haematogenous or lymphogenous by way of the throat organs. In 150 cases of bilateral pulmonary tuberculosis the cervical lymph nodes were enlarged in 61 per cent. Bilateral adenopathy was observed chiefly in patients with laryngeal tuberculosis. The observations recorded do not accord with the conception of tuberculous superinfection, descending from the mouth and pharyngeal region.—*Significado de la adenopatia cervical en la tuberculosis pulmonar, F. D. Gómez, J. C. Negro & A. R. Ginés, Rev. de tuberc. d. Uruguay, 1939, 8: 66.*—(*E. R. L.*)

Axillary Adenopathy.—In 108 cases of pulmonary tuberculosis axillary adenopathy was present in 81.4 per cent. In the majority of cases the pulmonary disease was bilateral. Usually the increased size of the axillary lymph nodes was bilateral. Occasionally unilateral axillary adenopathy was observed, but always homolaterally in cases of unilateral pulmonary tuberculosis. Of the 18.6 per cent of cases without axillary adenopathy the great majority were arrested or characterized by regressing lesion. In only 3 cases was axillary adenopathy absent in the presence of active tuberculosis. Coexistent syphilis did not modify the character of the involvement. The most frequent site of enlarged glands was the thoracic wall of the hollow of the axilla. The glands were usually firm. Rarely was there pain. No relation seemed to prevail between the volume of the nodes and the anatomical type of the pulmonary lesion.—*Adenopatia axilar y tuberculosis pulmonar, F. D. Gómez & A. R. Ginés, Rev. de tuberc. d. Uruguay, 1939, 8: 28.*—(*E. R. L.*)

Lymph Node Tuberculosis.—Lymph node tuberculosis is very frequent, the cervical region being most often involved. This disease is polymorphous both from the point of view of the number of nodes involved and the variety of anatomical and pathological lesions. Whenever cervical tuberculous lymphadenitis is discovered, all other accessible nodes, including the mediastinal nodes, should be investigated. By examination of surgical material three stages in the development of tuberculous lymphadenitis can be demarcated. At first the node is solid and tumor-like and on section a number of small yellow areas are seen. In the second stage the node is almost entirely composed of caseous material which has not yet undergone liquefaction. In the third stage the caseous material has been liquefied and an abscess containing tuberculous pus has been formed. This abscess may remain encysted for a long time, but rather frequently, after varying periods of time, spontaneous perforation with fistula formation occurs. This fistulization also occurs when the abscess is drained. Either spontaneously or under the influence of treatment such tuberculous abscesses may heal by cicatrization. Typically there is no reaction surrounding these nodes. The nodes can be individually distinguished and section often reveals all three stages of pathological development going on at the same time. When secondary infection supervenes, there is involvement of the surrounding tissue with matting together of the nodes into one mass. In one form of the disease the lesion is arrested at the first stage of development before caseation has occurred. These nodes form large solid masses which are often difficult to differentiate from other lymphopathies such as Hodgkin's disease. Tuberculous lymphadenitis may be generalized, but not as a rule; Hodgkin's disease, on the other hand, is most frequently a generalized disease. Three cases are discussed to illustrate the various types of tuberculous lymphadenitis.—*Tuberculose ganglionnaire, Lenormant, Progrès méd., July 29, 1939, no. 30, 1079*—(*H. R. N.*)

Cervical Adenopathy.—Opinions differ on the coëxistence and relationship of pulmonary tuberculosis and tuberculosis of the cervical lymph nodes. The authors base conclusions on the study of 1200 patients admitted to a hospital service for adult pulmonary tuberculosis. Cervical adenopathy with obvious

swelling was seen in only 8 patients, or less than one per cent. The ages of the patients concerned ranged from fifteen to fifty years. The aspect and localization of the adenopathy in the several cases is more in favor of haematogenous than lymphogenous infection. In the majority of cases the clinical course of the disease was favorable.—*Frecuencia y significado de la adenopatia cervical tumoral en los tuberculosos pulmonares adultos, F. D. Gómez, J. C. Negro & J. L. Vilar del Valle, Rev. de tuberc. d. Uruguay, 1939, 8: 60.*—(*E. R. L.*)

Tuberculous Splenomegaly.—While investigating a series of cases of chronic splenomegaly 3 cases of tuberculous nature were discovered; two, simulating splenic anaemia and one Hodgkin's disease. These are presented in detail. The first case, a married woman of fifty-five, presented clinical features of splenic anaemia, subcutaneous haemorrhages, uterine bleeding and a low platelet count. The uterine bleeding was controlled by radium and surface application to the spleen resulted in reduction of size but no improvement in the anaemia or general condition. The tuberculous nature of the splenomegaly was not suspected until histological examination after splenectomy. The second case, a single woman of thirty-three, presented marked splenomegaly, slight liver enlargement, ascites and anaemia. Chest X-ray films were, unfortunately, omitted. At the age of fourteen there has been an operation for tuberculous peritonitis. A few months later, there was a tuberculous sinus which healed with conservative measures, three years later ascites and fourteen years later severe haematemeses. The clinical features suggested Banti's disease but an attempted splenectomy had to be abandoned because of dense adhesions about the spleen. Lassitude, weakness, dyspnoea, abdominal swelling and pain over the spleen persisted. There was improvement under iron therapy sufficient to permit a more or less normal life until termination over thirty years after the initial symptoms by haematemesis. It appears that adhesions due to the tuberculous peritonitis resulted in portal and splenic vein obstruction with enormous splenic enlargement and ascites. The third patient, a male of eighteen, had for seven years generalized enlargement of the superficial lymph nodes, some soft and caseous, others calcified, with enlarged liver and spleen. There was a terminal miliary dissemination involving lungs, kidneys, liver, spleen and lymph nodes. There were found on necropsy also dense bilateral pleural adhesions and chronic mediastinitis with firm matting together of structures. The symptoms of tuberculous splenomegaly are pain, dyspnoea, emaciation, fever and gastrointestinal disturbances. The age incidence is most common between twenty and forty. The blood picture is inconstant but a low color index, anaemia with leukopenia and relative lymphocytosis are most common. The diagnosis may be suspected when there is evidence of tuberculosis elsewhere in the body or tuberculosis contact history. Splenectomy is usually the treatment of choice. As an alternative deep X-ray therapy or radium may be tried but reported results are not convincing.—*Tuberculous Splenomegaly, L. Howells, Brit. J. Tuberc., October, 1939, 33: 178.*—(*A. P.*)

Tuberculous Empyema.—Preventive treatment directed toward diminishing the incidence of pleural effusion is important in the control of tuberculous pyopneumothorax. Cases subjected to pneumonolysis are prone to develop exudate, which may be obviated by improvement in technique. Weather is of influence; cold and rainy weather increase the incidence of exudation, even in cases not subjected to pneumothorax. Once established and past the acute stage, pyopneumothorax should be treated by aspiration, irrigation with small doses of antiseptic solution, such as azochloramine, and air replacement. While the exudate is purulent, aspirations should be made every five to eight days. When the exudate becomes serous, rather than purulent, aspirations can be made at intervals of two weeks. In advanced cases continuous aspiration is indicated, combined with the use of antiseptic solutions if the pleura is much thickened. Oleothorax is indicated if active lesions persist, particularly in exudates of marginal type. In stubborn cases thoracoplasty should be performed.—*El piotorax tuberculoso, G.*

Salazar, Bol. Asoc. Med. Puerto Rico, July, 1940, 32: 244.—(E. R. L.)

Genital Tuberculosis and Pleuritis.—Ninety-five women with genital tuberculosis are reported. The diagnosis was confirmed by laparotomy in 60 of the patients. Only 3 patients had active pulmonary lesions. A preceding pleuritis could be demonstrated in 41 per cent of the cases. The adnexal involvement occurred within the first five years after this condition. The peak of frequency of adnexal tuberculosis was found in the early thirties. It is emphasized that in adnexal disease of unknown aetiology a preceding pleuritis, particularly the exudative form, is strongly suggestive of tuberculosis.—*Über klinische Beziehungen zwischen Pleuritis und der Genitaltuberkulose der Frau, H. Winkler & E. Wegemer, München. med. Wchnschr., July 7, 1939, 86: 1036.—(A. B. T.)*

Bilateral Pleural Effusion.—The simultaneous occurrence of bilateral pleural effusions is rare except in cardiorenal disease and as a direct complication of bilateral artificial pneumothorax. The author has studied a series of 259 cases of pleural effusion at Jefferson Hospital and White Haven Sanatorium and has found no instance of the development of spontaneous bilateral simultaneous collections of fluid. Ninety-two effusions were definite complications of artificial pneumothorax, of which 14 cases were bilateral, the fluid having developed somewhat in relation to the progression of the pneumothoraces; in 3 cases of bilateral pneumothorax the fluid was limited entirely to one pleural cavity. Five patients with effusions of one pleural cavity following pneumothorax had subsequent development of fluid on the opposite side but only after the primary collection had disappeared. Effusions rarely occur simultaneously in the opposite or untreated pleural cavity. Four patients with inadequate unilateral artificial pneumothorax collapse of the lung developed fluid suddenly on the opposite side during attempts to forcibly reëxpand the slowly expanding lung by intrapleural suction. With each attempt there was severe pain in the chest with weakness and marked dyspnoea. The study suggests that the mechanical displacement of the mediastinum and stretching of the opposite lung causes a separation of the pleura, rupture of pleural lesions and the subsequent development of fluid, and emphasizes the need for great caution in dealing with the long-contracted lung. The lung should be allowed to expand slowly under the control of reduced artificial pneumothorax, and with its failure to expand a thoracoplastic operation should be performed in order to bring the pleural surfaces into apposition.—*The Incidence and Mechanism of Bilateral Pleural Effusions, B. Gordon, J. A. M. A., March 2, 1940, 114: 733.—(G. L. L.)*

Pleural Effusion.—Two hundred cases of osseous tuberculosis were studied and pleural effusions were found in 27 patients, or 13.5 per cent. Pulmonary lesions were found in 17 of those who had a pleural effusion. Tuberculosis of the spine was present in 15 patients with effusion and 8 of the group had multiple osseous lesions. In 14 cases the pleural effusion was present before there was any roentgenological evidence of osseous tuberculosis and in the remainder of the cases the effusion appeared subsequent to the demonstration of the lesions in the bone. A pleural effusion may be produced by any one of the following means: (1) haematogenous dissemination; (2) contiguous spread from the lung, the thoracic cage or the mediastinum; (3) lymphatic spread from the periphery of the lung or from the thoracic wall or abdomen. Despite the fact that a tuberculous lesion in the spine cannot be visualized roentgenologically, it may still be present and it is probable that many pleural effusions arise from this source. In all cases in which there was tuberculosis of a rib an effusion was present on the same side.—*Pleural Effusions in Association with Osseous Tuberculosis, W. Cohen & H. K. Taylor, Quart. Bull. Sea View Hosp., October, 1939, 5: 3.—(A. A. E.)*

Tuberculous Arthritis of Hip Joint.—Fifty-five cases are reported ranging in age from nine months to thirteen years. In these cases the medial half of the acetabular roof was the most frequent focus of tuberculous infection.

The femoral neck was next in frequency of involvement. Forty-three cases were treated conservatively. There was involvement of the proximal joint in 40 cases. In 12 cases excision of the extra-articular foci was accomplished by curettment. Eleven had hip joint involvement. Only one in which the lesion was in the great trochanter remained free of joint involvement. Photographs of X-ray plates of representative cases are included. Most lesions eventually involve the proximal joint. This is not discovered early because foci are frequently too diffuse or minimal to be demonstrated. The study demonstrates that in extra-articular tuberculous disease of the hip the gain obtained by excision of the obvious foci over conservative treatment is too small to be of significance. Erroneous conclusions are occasionally made after excision of obvious foci because local as well as general improvement occurs temporarily. Fewer than 10 per cent of children with extra-articular tuberculous disease of the hip recover with an intact functional hip joint.—*The Distribution and Treatment of Extra-Articular Foci in Tuberculous Arthritis of the Hip Joint, J. A. Cholmeley, Brit. J. Surg., October, 1939, 27: 224.*—(*F. J. P.*)

Bone Tuberculosis.—The authors present a study of 5 cases which illustrate the capacity of the ossification centres of epiphyses of young children to regenerate after they have been partly or completely destroyed from extension by continuity of pyogenic or tuberculous infections. This ability to regenerate is directly related to the amount of cartilage that survives. The persistence of a broad space in the epiphyseal region, which does not cast a shadow of bony density in roentgenograms, is indicative of the preservation of cartilage. In the cases reported there was reappearance of a bony center with progressive growth and ossification of the remaining cartilaginous epiphysis. Marked destruction of the bony center of the capital epiphysis with subsequent reossification was observed in one case of tuberculosis, primary in the neck of the femur. Longitudinal growth of the shaft continued in each case. This indicated a remarkable degree of preservation of the growth cartilage disk in the presence of extensive destruction of the epiphysis itself.—*Regeneration of Epiphysial Centers of Ossification: Following Destruction by Pyogenic or Tuberculous Infection: Report of Five Cases, S. W. Banks, W. Krigsten & E. L. Compere, J. A. M. A., January 6, 1940, 114: 23.*—(*G. L. L.*)

Tuberculosis of Mandible.—This disease is not as infrequent as heretofore considered. The author reports a series of 14 cases, 8 of which were seen in a period of two and one-half years. Mandibular involvement occurs almost equally frequent in both sexes. The ages ranged between four and forty-eight, the majority of the patients being in the second and third decades. The right side of the mandible is affected twice as often as the left. Neither trauma nor dental caries seemed to be of aetiologica significance. The onset is insiduous, pain is not essential, progressive local swelling, softening, spontaneous rupture, sinus formation and secondary infection are the usual sequence of events. Roentgenographically, rarefaction, necrosis and sequestration without involucrum are the characteristic findings. About 43 per cent of the patients had tuberculous lesions in other bones of the body, and the skull was involved in 29 per cent of these cases. In 10 of the cases in which the chest was studied radiographically, evidence of tuberculous involvement of the lung or pleura was noted in all. Treatment usually consists of incision and drainage, sequestrectomy and partial ostectomy locally, as well as general antituberculous measures. The author feels that tuberculous involvement of the mandible is almost always haematogenous arising most likely from a focus in the lung, although the possibility of local invasion is recognized. The author explains the rarity of the latter by the local immunity to the tubercle bacilli.—*Tuberculosis of the Mandible, C. M. Meng, J. Bone & Joint Surg., January, 1940, 22: 17.*—(*M. A. B.*)

Tuberculosis of Long Bones.—Tuberculosis of the shafts of the long bones is rare in this country. A study of 95 patients in whom 123 long bones were involved is presented. All cases were of proven tuberculous aetiology.

The tibia and the femur were most often involved. The patients' ages ranged from six months to seventy-five years and of these 48 per cent were twenty or more years of age at the time of onset. The authors point out that this finding is contrary to the opinion that shaft tuberculosis occurs predominantly in children, although they are aware of the possibility that the disease, frequently of low virulence, may start in the bones months or years before the onset of symptoms. The disease in most instances is of a chronic character and the symptoms may present themselves at various intervals. Active tuberculous lesions were found in 37 patients, of whom 25 had pulmonary involvement. Only 11 of the 95 showed joint disease. The latter is explained by the possibility of the low virulence of the bacilli and also by the ability of the synovia to resist disease. Seventeen of the 37 patients died. Healing occurred in 92 per cent of the 13 patients treated by curettage or saucerization and closure and the authors think these are the treatments of choice. Healing took place in 66 per cent of those cases treated by incision and drainage. Amputation and excision gave good results in 67 per cent and 50 per cent of cases, respectively. Of the 13 patients who were unable to receive any therapy, 8 died and 5 showed spontaneous healing. The authors point out the fallacy that healing might have taken place in other cases if surgery had been delayed and also that a fundamental principle in treating tuberculosis is to avoid secondary infection.—*Tuberculosis of the Large Long Bones of the Extremities, W. B. Carrell & H. M. Childress, J. Bone & Joint Surg., July, 1940, 22: 569.*—(*M. A. B.*)

Tuberculosis of Spine.—In Pott's disease tubercle bacilli may reach the bones either through the blood stream, after entering it from a focus usually in the peribronchial or retroperitoneal lymph nodes, or by extension from adjacent infected lymphatic tissue. With increase in bacilli there is an initial reaction manifested by an accumulation of leukocytes in the area. The latter are then phagocytosed by the macrophages. There is then an infiltration of monocytes, epithelioid and multinuclear giant cells. This forms the tubercle. The tubercle does not contain blood vessels and is supported by a reticular structure. Central caseation occurs as the tubercle increases in size. Necrosis of the tubercle appears to be due to the lack of blood supply rather than a toxic effect from the bacilli on the cells and the author feels that the epithelioid cells appear to serve as a host to the tubercle bacillus and an aid to the spread of the disease to the adjacent tissue. The bacilli are difficult to find in sections of tuberculous bone in human beings. Around the mass of epithelioid cells is a zone of lymphoid cells and beyond this is a zone of nontuberculous inflammatory tissue. When the patient's resistance is high the fibroblasts in the latter zone proliferate and form collagenous fibrous tissue which in turn matures, contracts and isolates the epithelioid cell mass. The tubercle in this mass may ultimately die. The patient who develops Pott's disease fails to develop an adequate capsule and the bacilli and the epithelioid cells invade the adjacent tissue. The central area degenerates and an abscess is formed. The abscess follows the path of least resistance but maintains a definite limiting wall until it ruptures through the skin. A sinus may persist. In some instances the disease quiets down, the contents are inspissated and calcium deposition occurs. In cancellous bone the area of tuberculous granulation tissue enlarges easily. It is believed that the disappearance of the red bone marrow from the area of activity is due to some bacillary toxin. The living bone trabeculae become atrophied as the advancing process closes off the blood supply. The bone is absorbed largely by the epithelioid cells. Tuberculous inflammatory tissue penetrates the cortical bone and is able to erode through the articular and epiphyseal cartilage. The lack of new bone formation is a characteristic of this disease. Sequestra of large size are rarely seen. Tuberculosis of the spine is classified into the central, the epiphyseal and the anterior types. The localization of the disease is determined by the anatomical arrangement of the blood vessels. The author notes that the epiphyseal type is more frequent than the anterior type in spite of the poorer vascularity and that the blood

supply does not satisfactorily explain the reason the spine is peculiarly susceptible to tuberculosis in contrast to pyogenic infections. The central type of the disease may spread to the other vertebrae without passing through the disc by passage of the infection along the anterior longitudinal ligament or it may encircle the dura after eroding through the posterior cortex. This type of the disease is not often diagnosed until considerable destruction has occurred. The epiphyseal type spreads to the intervertebral disc and through the nucleus pulposus to the adjacent vertebra. Here symptoms are noted early. Abscesses which arise above the diaphragm tend to remain in the chest cavity or to emerge posteriorly. Those that arise below the diaphragm tend to enter the pelvis and to emerge either in the groin, the thigh, or the lumbar region. Secondary infections in well walled off abscess cavities that are draining are rarely dangerous. Tuberculosis of the spine is in many respects a self-limiting disease, it tends to progress for months or years and then an equilibrium is established between the patient and the virulence of the organism; the lesions tend to heal by fibrosis in adults and by fusion of bone in children. The author feels that probably no tuberculous spine ever heals completely and that a focus always persists which may become active under unfavorable circumstances. Spinal fusion tends to lessen the probability that such conditions will arise and it also tends to hasten the healing process.—*Pathology of Tuberculosis of the Spine, J. A. Key, J. Bone & Joint Surg., July, 1940, 22: 799.*—(*M. A. B.*)

Spine-Fusion Operation.—The purposes of the spine fusion operation are to eliminate motion at the vertebral joints, thus establishing a state of rest; to prevent an increase of the deformity; to aid in the disappearance of paravertebral abscesses; in children, with the cessation of the tuberculous activity, to permit the growth in height throughout the fused segment; to permit the patient to become ambulatory at an earlier date. The repair processes once initiated after a successful fusion will continue to a point where the roentgenographic appearance of the previously diseased bone is entirely healthy, with or without bony ankylosis. Two chief causes of an unsuccessful outcome are the inability of the patient's tissues to resist tuberculosis and the failure of the fusion to become solid or to cover a sufficient number of vertebrae. Factors that influence the course of the disease are, the inherent resistance of the patient, the virulence of the organism, the extent and severity of the infection, and tissue resistance. Of a total of 584 patients who have had a spine-fusion operation for tuberculosis of the spine, 61 per cent have been observed regularly. 160 of the total were children less than five years of age. Of the 259 cases in children up to ten years of age, 53 per cent had symptoms present less than one year, 83 per cent had an active lesion at the time of fusion, 17 per cent were recumbent for over four months after the fusion and 13 per cent had pseudoarthrosis. In the group of patients eleven years and over the figures were 29 per cent, 68 per cent, 8 per cent and 16 per cent, respectively. There were 168 known deaths in the group studied and of the one to ten year cases 26 per cent died of meningitis, 7 per cent of pulmonary tuberculosis, and 23 per cent from other forms of tuberculosis. In the older age group the figures were 11 per cent, 17 per cent, and 21 per cent, respectively. The end results in the first group were 54 per cent excellent and early and 18 per cent excellent but delayed as compared to 44 per cent and 9 per cent, respectively in the older group.—*End Results of the Spine-Fusion Operation for Tuberculosis of the Spine, W. E. Swift, J. Bone & Joint Surg., July, 1940, 22: 815.*—(*M. A. B.*)

Tuberculosis of the Spine.—In the United States, tuberculosis of the vertebrae is due almost exclusively to infection with the human type of bacillus. The infection is most often acquired by inhalation and the primary lesions are usually in the lungs. This is followed by a haematogenous dissemination. The susceptibility to this form of dissemination is influenced by the extent of the caseous lymphadenitis, by the intensity and frequency of the repetition of infections and by the race and the age of the patient. Children and Negroes have shown the greater susceptibility to blood borne in-

fections. Factors which favor localization of the disease include the blood vessel arrangement and the distribution of the monocytes. A feature of this disease is the frequent latency and subsequent reactivations. Two peaks of incidence are seen in tuberculosis of the spine; the first between birth and nine years and the other between twenty and thirty-five years and the author feels that the latter rise is related in a great part to constitutional variations. In adults the increased specific immunity, the greater compactness of the bone structure and the less severe form of haematogenous infection help to account for the higher incidence of localized and less destructive lesions as compared to those seen in children. Pulmonary lesions, apart from being the common origin of vertebral tuberculosis, often complicate the picture because of their extent, activity and chronicity. The incidence of tuberculosis of the vertebra in the Negro is 21.4 per cent. This is much higher than the percentage of Negro population in the total population. The greater incidence of haematogenous lesions in the Negro is a genetic characteristic. This group has shown a greater tendency to caseation, less healing power and, in the presence of vertebral or other forms of haematogenous tuberculosis, a decided tendency to further dissemination of the infection. The source of vertebral tuberculosis should be sought for in the chest. The pulmonary focus may be insignificant and the more important lesion may be found in a mediastinal lymph node. Since the vertebral focus is one manifestation of a haematogenous dissemination, other foci should be looked for at intervals. The treatment of associated lesions will depend on their location and their activity. The medical treatment of this disease should be designed to control other active lesions as well and to avoid exacerbation of these. In any form of tuberculosis adequate healing cannot be expected until the activity has subsided and the process of caseation and liquefaction has been arrested. Initial rest treatment aids in the stabilization of the lesion. This must include the elimination of all deleterious influences. The course of the disease is followed by periodic erythrocyte sedimentation tests and leukocyte studies. This period of stabilization may require many months. The diet should contain all the necessary elements, be of sufficient quantity, of good quality, well prepared and tastefully served. Physical agencies are useful to preserve and stimulate physiological tone and to promote relaxation. Except for certain superficial lesions the author doubts whether heliotherapy is lethal for bacilli in the tissue or that it accelerates healing in a specific way. In principle, operative therapy is most effective ultimately after the active process subsides and encapsulation has begun. Surgical treatment may be harmful if started at a time when the disease is still in a phase of haematogenous dissemination.—*Pathogenesis and Medical Treatment of Tuberculosis of the Vertebrae, J. B. Amberson, Jr., J. Bone & Joint Surg., July, 1940, 22: 807.*—(*M. A. B.*)

Tuberculosis of Spine.—Although a diagnosis of tuberculosis of the spine was made in 2080 patients in a period of 23 years, only 480 patients had surgical fusion. The average age was more than thirty years. The average duration of symptoms was 2.5 years. Pulmonary involvement was present in 46.89 per cent of the patients. The predominant occupations were manual labor (29.3 per cent) and housework (22.3 per cent). The larger number of lesions were in the thoracic and the lumbar regions. Deformity was present in 73.1 per cent, abscesses were noted in 61.6 per cent at the time of operation. Abscesses were untreated unless they caused pressure symptoms or bone absorption. Incision and drainage were rarely indicated and aspiration was done only when necessary, through healthy tissues. Abscess may be an indication for the operation. Abscesses seem to absorb more rapidly when the patient's resistance is good. Sinuses heal best under immobilization and heliotherapy. Spinal cord complications were noted in 17.5 per cent of cases, and in the early cases treatment is conservative. Fractures of the bone graft occurred in 16 patients within the five years after the operation. The surgical mortality was less than one per cent. The postoperative results were: 63.64 per cent good and able to return to work; 7.83 per cent were improved; there was no improvement in 6.3 per cent; and 18.43 per cent were dead

within five years. Of the 28 patients who were less than sixteen years of age at the time of operation, 12 had good results, 2 showed improvement, 5 no improvement, one died of shock and 4 died within the five year follow-up period. Abscesses were present in all these cases preoperatively. The author feels that surgical fusion of the spine is a comparatively safe procedure. It gives stability to the disease process but it is not necessarily a cure. Results of this operation are probably better in adults than in children and therefore it is best delayed in children until after the process is quiescent. The best results are obtained by careful selection of patients for operation, the use of spine fusion during the period of healing and the reinforcement by conservative measures for a period of time. No surgical treatment, in itself, offsets the value of conservative treatment.—*Tuberculosis of the Spine: Treatment and Results, H. W. Meyerding, J. Bone & Joint Surg., July, 1940, 22: 840.*—(*M. A. B.*)

Bone Tuberculosis and Spina Bifida.—In 310 patients with roentgenologically demonstrable skeletal tuberculosis *spina bifida occulta* was present in 29 per cent. In 364 additional anatomical specimens *spina bifida*, without evidence of skeletal tuberculosis; was found in 28 per cent. From this investigation it was concluded that *spina bifida* cannot be considered an indication of predisposition to skeletal tuberculosis.—*Missbildungen der Wirbelsäule und ihre Bedeutung für eine "angeborene" Tuberkuloseanfälligkeit des Skelettsystems, O. Schedtler & H. Böttner, Ztschr. f. Tuberk., April, 1939, 82: 105.*—(*A. B. C.*)

Tuberculosis of Chest Wall.—Infection of the lung or pleura usually originates in some therapeutic intervention, the chest wall infection adding to the complications and difficulties associated with active pulmonary disease. Empyema necessitatis, formerly considered due frequently to needle track infection in the attempt to aspirate an empyema, is now recognized as no less common in those untreated, and possibly rendered more likely by inadequate drainage. Infecton of a thoracoplasty wound or extrapleural pneumothorax space is another possible factor, this being caused by inadvertent opening of a superficial cavity in the process of "stripping" the adjacent lung tissue from the chest wall and subsequent development of a broncho-extrapleural fistula, again most likely when the outer wall of a large cavity approaches the surface or an adherent strip of lung tissue becomes devascularized and necrosis and fistula formation occur. Most patients in the first category die on the table, whereas those in the second who survive the initial infection may recover following repeated aspirations of the pus, and later thoracoplasty. Tuberculosis of the chest wall may also develop after thoracoplasty even without evidence of fistula, probably by migration of infecting bacilli from lymph nodes of the endothoracic fascia. In the Semb type of apical thoracoplasty the nodes located in the back of the intercostal spaces in the paravertebral gutter are demonstrably infected. Mixed infection, usually staphylococcic, should be suspected in the presence of high swinging temperature with signs of toxaemia. Fluid in the deeper layers may exist even though the skin wound appears normal. Most such cases need prompt drainage. Infection of the plane of endothoracic fascia is difficult from the standpoint of treatment. The common clinical picture is a superficial swelling connected by an opening with the deeper lying layer, and there is usually an impulse on cough. Lipiodol injection through a fine catheter may be informative. Most cases point anteriorly, a few posteriorly in the interscapular region. Since the communicating opening is inconspicuous, adjacent granulation tissue near the ribs may be mistaken for periosteitis. On removing sections, however, a series of tracks and pockets are demonstrable extending to the anterior mediastinum. Their walls may be thick and calcified. The origin of the process may be the lymph nodes of the thoracic wall, of which there are two main groups, those about the internal mammary vessels and those in the endothoracic fascia near the vertebrocostal anticulations. Anteriorly, between the intercostal muscles, there are nodes which may caseate, and the infection follows along and penetrates either the anterior intercostal structures or posteriorly near the *erector spinae*. Penetration of the pleural layers from the endo-

thoracic fascia is practically unknown. The roentgenographic morphology may be misleading, spots of calcification simulating intrapulmonary densities and granulation tissue producing shadows interpreted as pleural densities or sometimes as pulmonary lesions. Sixty-six cases of tuberculosis of the ribs, sternum and costal cartilages were recorded at St. Thomas' Hospital, London, between 1929 and 1938. The sternum was involved in 10 with small localized rarefactions near the costochondral junctions with adjacent granulations and cold abscesses. The periosteum was usually lifted off by accumulations of pus. The bony medulla was rarely involved. Three chief theories of origin are: (1) haematogenous; (2) original tuberculous periosteitis and perichondritis; (3) original involvement of chest wall lymphatics, best supported by evidence. The treatment consists of localized surgical extirpation with limited excision of nodes likely to be involved, and the results are good, except in sternal cases which require preliminary aspirations and curettage after sinus formation. Tuberculosis of the breast is quite rare and comprises 0.5 per cent of all breast lesions in a controlled series. The route of infection is probably retrograde from tuberculous axillary nodes in most cases, haematogenous in a few others. Injury is rarely a possible factor. Women of twenty to fifty are usually affected. Three forms are described: (1) localized firm nodular forms to be differentiated from scirrhous carcinoma; (2) cystic tumor resembling galactocoele; (3) multiple indurated sinuses discharging at various points, sometimes a sequel of the first two, sometimes originating from multiple foci. Diagnosis is established by examination of pus or biopsy. Surgical removal is rarely complicated by acute dissemination elsewhere.—*Tuberculosis of the Chest Wall, N. R. Barrett, Tubercle, July, 1939, 20: 445.*—(*A. P.*)

Primary Tuberculosis of Middle Ear.—A child, two years of age, who died from tuberculous meningitis, presented at autopsy primary tuberculosis of the left middle ear. The primary complex consisted of tuberculosis of the middle ear and a caseous retropharyngeal lymph node. Spread of the tuberculosis from this area to the tonsils and adjacent lymph nodes was observed. There was no evidence of direct spread of tuberculosis from the middle ear to the meninges. In the author's opinion meningitis was due to a haematogenous spread from one of the lymph nodes. There was no pulmonary tuberculosis.—*Beitrag zur extrapulmonalen primären tuberculösen Infektion im Kindesalter (primäre Tuberkulose des Mittelohres), M. Schwaiger, Ztschr. f. Tuberk., February, 1940, 84: 212.*—(*G. C. L.*)

Tuberculosis of Nasopharynx.—For many years the demonstration of tubercle bacilli in sputum or gastric contents has been considered indicative of pulmonary tuberculosis. More recently tubercle bacilli have been found originating from lesions of the tracheobronchial tree. However, there are also numerous reports in the literature of sputum-positive cases in adults and children having no roentgenographic signs of tuberculosis. The author presents two cases shown to have tuberculous lesions of the nasopharynx. Both raised sputum in the manner characteristic for postnasal discharge, in both the sputum contained tubercle bacilli, and in one frequent X-ray films of the chest and bronchoscopic examination were negative for tubercle bacilli. Surgical removal of the focus in this case relieved the patient of the symptoms and positive sputum, and made isolation no longer necessary. It is suggested that the nasopharynx as a possible source of tubercle bacilli in the sputum should receive more serious clinical study and that, when chest roentgenograms show no evidence of tuberculosis, a tuberculous lesion of the nasopharynx as well as one in the tracheobronchial tree should be suspected.—*Tuberculosis of the Nasopharynx, J. W. Trenis, Am. J. M. Sc., March, 1940, 199: 312.*—(*G. F. M.*)

Intestinal Tuberculosis.—During a five-year period from 1934 to 1939 autopsies were performed on 1043 cases of tuberculosis at the Sea View Hospital. Of this number, 734, or 70.4 per cent, had intestinal tuberculosis. The incidence is similar to that observed by most authors. In age the patients varied from two months to seventy-seven years. The greatest

number of cases of intestinal tuberculosis occurred in patients between the ages of twenty and thirty-nine years, in which group there were 565 cases of which 430, or 76 per cent, had intestinal involvement. Above the age of twenty-nine the incidence of intestinal tuberculosis falls. The highest incidence (78.5 per cent) was in patients from ten to nineteen years of age. In females the incidence of intestinal tuberculosis was 74.6 per cent and in males it was 68.2 per cent. Intestinal tuberculosis was found in 72.7 per cent of those patients with caseous pneumonic tuberculosis, and in 45 per cent of those with chronic haematogenous tuberculosis. Of 25 cases with acute miliary tuberculosis, 16 (63.8 per cent) had intestinal involvement. Caseous mesenteric lymph adenitis was found in 24.4 per cent of the cases with intestinal tuberculosis, but in only 6.16 per cent of those without intestinal involvement. There were 20 cases of tuberculosis of the bile ducts. Amyloidosis was but slightly more frequent in those cases with intestinal involvement than in those that had normal intestines. The ileum was found to be involved in 89 per cent of the cases and the caecum in 75.8 per cent. The earliest lesions are found in the lymphoid tissue of the submucosa. The caseation which takes place in the lymph follicles finally involves the mucosa with resultant ulceration. The early ulcers are superficial, irregular, with undermined edges and a floor formed by the submucosa. As the ulcer enlarges necrosis may penetrate deeper into the wall of the intestine and may eventually involve the serosa. The incidence of intestinal involvement varies directly with the number of tubercle bacilli in the sputum. Because of the high incidence of intestinal involvement in patients with acute miliary tuberculosis (63.8 per cent), it is probable that the haematogenous mode of infection is much more common than has been generally recognized. Perforation of the intestine occurred in only 28 cases (3.81 per cent). Generalized peritonitis occurred in 10 of these cases, localized peritonitis in 16, and extraperitoneal perforation in the remainder. Tuberculous peritonitis was found in 10.4 per cent of the 1043 cases studied. Tuberculous peritonitis, except in those cases due to perforation of a tuberculous ulcer, is not related to intestinal tuberculosis. The highest incidence of involvement was in those patients with pulmonary symptoms of one to twenty-three months' duration before death. As the duration of pulmonary symptoms increases, the incidence and severity of intestinal tuberculosis decreases. One hundred and thirteen cases in which autopsy was performed had had roentgenographic study of the intestinal tract. The roentgenological diagnosis and autopsy findings agreed in 80 cases (70.8 per cent).—*Intestinal Tuberculosis, A Clinical Pathological Study, J. H. Cullen, Quart. Bull. Sea View Hosp., January, 1940, 5: 143.*—(*A. A. E.*)

Tuberculosis of Pulmonary Valve.—Involvement of the epicardium and myocardium in generalized miliary tuberculosis is not unusual. Involvement of the endocardium is less common, and of the valves comparatively rare. A case of tuberculous involvement of the pulmonary valve in a colored male, aged twenty-one years, who had advanced tuberculosis of the prostate, dorsal vertebrae and lungs, with terminal miliary dissemination, is reported. The postmortem examination of the heart revealed no tubercles in the epicardium, myocardium or on the endocardium of the chambers. The aortic, mitral and tricuspid valves were normal. The sinus of Valsalva of the right anterior cusp of the pulmonary valve was about half filled with a yellowish, firm irregularly shaped mass, firmly adherent to the proximal portion of the cusp, but not adherent to the intimal surface of the pulmonary artery. The distal half of the leaflet was not involved. The ventricular surface of the valve appeared normal. The lesion of the pulmonary valve, on microscopical examination, showed typical tubercles with central areas of necrosis and the presence of acid-fast bacilli. The process involved the valve ring but did not extend into the myocardium. The proximal half of the valve cusp was destroyed while the distal portion escaped. It is a disputed question in tuberculous lesions of the endocardium and the valves whether the bacteria are deposited from the blood passing through the chambers of the heart or from the nutrient vessels of the heart. In this case the lesion corresponds to the dis-

tribution of the vessels which form a plexus in the base of the cusp and extend outward half the width of the cusp.—*Tuberculosis Involving the Pulmonary Valve, H. R. Gilmore, Jr., Am. J. Path., March, 1940, 16: 229.—(J. S. W.)*

Tuberculosis of Skin.—Skin tuberculosis may be due to primary infection or to superinfection. The latter is the more frequent form and may be caused either by autoinfection or by contact with other persons. In patients with skin tuberculosis 60 to 70 per cent show well defined but inactive pulmonary lesions, 20 to 30 per cent show active lung disease and 10 per cent have open tuberculosis. Three factors characterize tuberculosis of the skin: (1) The presence of tubercle bacilli demonstrable in either histological preparations or cultures; (2) positive guinea pig inoculation; (3) positive tuberculin reaction (which should be carried out with caution). A certain number of skin conditions do not conform to the first two items. They were classified as "tuberculides" by Darier in 1896. The following years have shown that their relationship to true tuberculosis of the skin is closer than originally assumed. Ziller's opinion, now generally accepted, is quoted: "Tuberculides develop only in patients with general tuberculosis and with a good allergic immunity. They are caused by haematogenous spread of virulent bacilli, never by their toxins at a place remote from their formation. The presence of bacilli is difficult to prove because only few of them are spread and because these few are readily destroyed by the cellular reaction of the allergic skin." A review of the most important forms of skin tuberculosis, their morphology, course and diagnosis is given. *Lupus vulgaris, scrophuloderma, tuberculosis cutis verrucosa*, the cadaver tubercle as well as the papulo-necrotic tuberculides and the rare *lupus miliaris disseminatus* are briefly described. A more frequent disease is *lichen scrophulosum*, a tuberculide which occurs mainly in childhood and adolescence. Characteristic are numerous foci of small nodules with a desquamating surface distributed all over the trunk. *Tuberculosis indurativa* is localized mainly on the legs, less frequently on the thighs, and shows definite indurations of the deeper layers of the skin, which are rather painful on pressure. They are nonadherent to the adjacent tissues. Ulcerations may occur. The possibilities of treatment, such as Finsen-light therapy, Gerson-Sauerbruch's diet, Wucherpfennig's operation with the electric loop and application of Bucky-ray or X-ray treatment are briefly discussed.—*Die Tuberkulose der Haut, F. Bering, München. med. Wchnschr., August 4, 1939, 86: 1185.—(A. B. T.)*

Tuberculoma of Brain.—The reported incidence varies considerably but the figures reported by Garland and Armitage at Leeds, England, 1910 to 1931, cite 2 per cent of all necropsies (13,000) showing cerebral tumor and, of these, over one-third were tuberculomas. Cushing's figures, from the United States, are much lower, while Wakeley in his series cited has found 5.9 per cent of all intracranial tumors tuberculomas. The incidence in childhood exceeds that for adults by 4 to 1. Below the age of twenty-three approximately 60 per cent of all cerebral tumors diagnosed were found tuberculous. Two principal types, (1) circumscribed and (2) "en plaque," affecting the meninges, are described. The former may occur anywhere, but especially in the cerebellum, and may be single, loculated or disseminated, or occasionally in the cord. The slower the growth the thicker the capsule. Central necrosis and involvement of adjacent meninges are the rule. The incidence of associated tuberculous meningitis is fairly high and, if the lesion is in proximity to the meninges, changes in the spinal fluid are common; e.g. increased pressure and protein, and pleocytosis. Secondary changes due to obstruction are common, i.e. hydrocephalus from blocking of the ventricular system from pressure on the aqueduct or roof of the fourth ventricle. There is commonly evidence of tuberculosis elsewhere, e.g. lungs, spine, genitalia and suprarenals. Some degree of fever is common. Sometimes the initial lesion may be in the cervical spine, middle ear or sinuses. "Tuberculoma en plaque" is much more rare, usually extensive and caseating, and headache and fits of Jacksonian convulsions are very common. Focal signs, if the

lesion is cerebellar, may consist of nystagmus, abnormal position of the head with occiput toward the shoulder of the affected side and eyes turned away, and tremor, which may be both constant and static, or intentional. There is unsteady gait with tendency to swerve or fall to the affected side, and Barany's past-pointing test may be positive. Speech is affected and *staccato* in type. With supratentorial lesions there will be loss of sensation, astereognosis contralateral convulsions. Local signs are due to increased cranial pressure, with headache and vomiting common, and, in children, bulging of fontanelles and sutures. Among general signs are fever, usually afternoon or evening type, of mild degree, sweating and loss of weight. An X-ray film of the skull may show actual calcification in the tumor, or hydrocephalus, or separation of sutures. Erosion of the clinoid processes and patchy rarefaction of the skull, a "silver beaten" effect, are characteristic. A negative Mantoux test is of value in exclusion only, whereas a positive Wassermann test may suggest gumma. Usually a tuberculous meningitis ends the scene, even in those rare cases of successful removal. Simple decompression with later heliotherapy is most favored, surgery only where special indications develop.—*Some Observations on Tuberculomas of the Brain, C. P. G. Wakeley, Brit. J. Tuberc., April, 1939, 33: 75.*—(*A. P.*)

Resection of Prostate.—Transurethral resection for benign hypertrophy of the prostate in debilitated elderly tuberculous patients has been done in 16 cases at Sea View Hospital. An accurate diagnosis is essential and diagnostic measures should include cystoscopy, excretory urography, phenolsulphonphthalein tests and repeated studies of the urine for the presence of acid-fast bacilli. Continuous catheter drainage should be used for several days preoperatively in order to effect a more adequate return of renal compensation and reduction of azotaemia. Immediately prior to operation, or several days before, if catheter drainage has been necessary, vasectomy under local anaesthesia is done in order to prevent the development of epididymitis. Low spinal or sacral anaesthesia has been found to be entirely satisfactory and does not affect the respiratory system. Thorough haemostasis by coagulation of bleeding points is essential. Following operation a Foley indwelling bag catheter is used for two to four days. In this series of 16 patients the results were entirely satisfactory both in respect to the local condition and the general condition of the patient. Prostatic hypertrophy occurs less frequently than does tuberculosis of the prostate in tuberculous patients.—*Transurethral Resection for Fibroadenomatous Hypertrophy of the Prostate in the Tuberculous Patient, M. E. Greenberger & J. H. Winer, Quart. Bull. Sea View Hosp., January, 1940, 5: 161.*—(*A. A. E.*)

Broncho-gluteal Fistula.—The authors report the case of a patient with a single tract fistula which crossed both the thoracic and abdominal cavities, causing a communication between the left bronchus and the gluteal region of the same side. Following an injury in the lumbar region the patient felt pain locally and consulted a physician, who made a diagnosis of renal ptosis on the right side and pulmonary tuberculosis. A year later the patient presented a tumor fluctuation in the upper third of the gluteal region, which was diagnosed as a cold abscess. On drainage of the abscess a bony body was encountered, which was identified as the transverse process of the third lumbar vertebra. On radiological examination, after injection of lipiodol, the fistulous tract appeared irregular in form and of oblique direction between the spine at the level of the first lumbar vertebra and the diaphragm. Radiographic examination of the thorax showed a communication between the bronchial tree and the fistula. Localization of tubercle bacilli in the vertebral body had produced tuberculous spondylitis forming a tuberculoma which proceeded to bone caries. The eccentric growth of the abscess spread the process to the abdominal region. The authors considered the long period of time on absolute bed rest as a cause of the condition. This position and the anatomical peculiarities of the posterior-lateral abdominal wall determined the direction of the resulting fistulous tract.—*Fistula bronco glúteal de origen tuberculoso, G. Machado &*

M. Diaz, Rev. de tuberc., January, 1939, 1: 26.—(E. C. I.)

Aberrant Lung Tissue.—Malformations of lung tissue may be classified as accessory or aberrant. Accessory malformations are due to faulty development of the lung anlage, early or late. They frequently cause symptoms. Diagnosis can usually be made by X-ray, bronchoscopy or bronchography. They usually have to be differentiated from an inflammatory process. Infection frequently occurs by way of the bronchial communication. Anatomically, these divisions are always intrathoracic when the pleural cavity is intact; their blood supply is that of the lung; there is no stalk, and forming a portion of the existing lung, communicating with the tracheobronchial tree, and usually containing all tissue elements of normal lung. Aberrant structures are due to faulty development of the lung anlage or they may arise from the primitive foregut. They rarely cause symptoms, are usually diagnosed by thoracotomy, and usually have to be differentiated from benign tumors. Infection is rare but may occur by lymph or blood stream. Anatomically, they may be extrathoracic; blood supply is usually systemic; a stalk is present; they are separate from existing lung; they have no communication with the tracheobronchial tree, and cartilage, muscle and mucous glands may be absent. The three cases presented indicate that aberrant malformations may cause symptoms because of their location and size, by growth and pressure, by incitement of pleural effusion and by inflammation borne by the lymph or blood streams. Under such circumstances, surgical excision is probably the proper treatment.—*Disease of Aberrant Intrathoracic Lung Tissue, S. O. Freedlander & P. W. Gebauer, J. Thoracic Surg., August, 1939, 8: 581.—(L. F. B.)*

Postnatal Growth of Lung.—The more important evidence concerning the character of postnatal growth of the lung has been histological. The presence of tubular sprouts and mitoses without evidence of distention of the lungs is the most significant detail of the microscopical picture. In order to determine whether or not the increased weight of the lung of the rat represented an actual increase in the number of alveoli, an approximate method of counting alveoli was devised. It was found that following removal of lung tissue in the rat, the increase in size of the remaining lung is accompanied by a new growth of alveoli. There is evident an initial decrease in alveoli three days after pneumonectomy, a return to normal within one week, and an increase above normal, even in older rats, at the end of thirty days. Compensatory hypertrophy and formation of new alveoli occur more rapidly in young rats than in old rats.—*The Postnatal Growth of the Lung, R. Cohn, J. Thoracic Surg., February, 1940, 9: 274.—(L. F. B.)*

Anatomy of Bronchi.—This is a study of the normal anatomy of the bronchi by means of dissections, bronchograms and casts of the bronchi. From this study has evolved a simple classification and nomenclature of the bronchi. The material used consisted of 15 dissections of the bronchi, 200 bronchograms and 30 bronchial casts made of a celluloid type of material (ivorine). The bronchi of both lungs are identical and homologous and of monopodous rather than dichotomous origin. The names of the bronchi correspond to their lobar localization, to their position and to their direction in the thorax. In this way the classification can be adapted to all phases of medicine and surgery. The branches are constant in spite of anomalies occasionally found. The classification is as follows: the right bronchus divides into three branches, the bronchus of the superior lobe, the middle lobe and the inferior lobe. The upper lobe bronchus divides into anterior, ascending and axillary bronchi. The anterior branch has internal, external and middle divisions. The ascending branch has anterior, posterior and external divisions. The axillary branch has posterosuperior and anterosuperior divisions. The bronchus of the middle lobe divides into inferoexternal and superointernal branches. The inferoexternal branch has posterior and anterior divisions. The superointernal branch has superior and inferior divisions. The bronchus of the lower lobe divides into ventral, dorsal, cardiac and unclassifiable terminal branches. The ventral branch divides

into a first, second and third division which in turn have internal and external subdivisions. The dorsal branch has a first, second, third and fourth division. The first division has an external, internal and superior branch. The second division has an internal and external subdivision. The cardiac branch has anterior and posterior subdivisions. The bronchus of the left lung divides into a bronchus to the upper lobe and one to the lower lobe. The upper lobe bronchus subdivides into ascending, anterior and descending branches. The ascending branch divides into anterior, posterior and axillary branches. The axillary has superior and inferior subdivisions. The anterior and descending branches of the left upper lobe bronchus subdivide into superior and inferior branches. The left lower lobe bronchus divides into ventral, dorsal, cardiac and unclassifiable terminal branches. The ventral branches subdivide into a first, second and third subdivision and each of these in turn have external and internal branches. The dorsal branch divides into a first, second, third and fourth branch. The first dorsal branch subdivides into a superior, internal and external branch, the second dorsal branch into an external and internal branch. The cardiac division has an anterior and posterior subdivision.—*Anatomie bronchique. Classification jusqu'auprès des bronches lobulaires, V. E. de Pablo, Arch. méd. chir. de l'app. respir., 1938, no. 6, 13: 441.*—(*J. E. F.*)

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